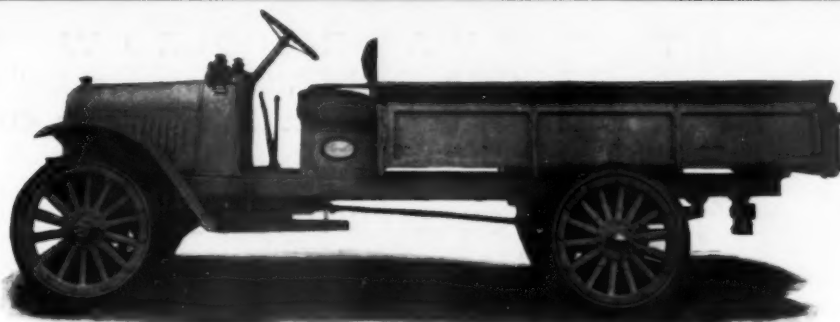


THE COMMERCIAL CAR JOURNAL

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.



The New Republic Three-Quarter Ton Model

Featuring an internal gear drive rear axle. Furnished complete, as above, \$995.00

A Republic Agency is a Money Maker

Republic Trucks have such a reputation for being all that is desirable in a truck that they sell with less effort than any other truck in their class.

Their value is so unquestioned, their efficiency so firmly established, their economy and adaptability so thoroughly demonstrated, their constructional units so widely known for quality and their design and capacities so effectually proved to be right, that a prospect is half sold when you approach him.

Conditions like these make selling easy and an agency profitable. That's why Republic dealers are money makers. The agency will be a money maker for you—write for particulars.

Three Models

MODEL F	MODEL L	MODEL D
1500 lbs. Capacity	2000 lbs. Capacity	3000 lbs. Capacity
\$995.00 (Express Body)	\$1350.00 (Chassis)	\$1475.00 (Chassis)

Most Rapid Selling Truck in America

*We want
high-class
representatives
in all
unoccupied
territory*



*Send
for
catalog and
details
of our
selling plan*



The CHASE New Sales Policy—

- ¶ The **NEW WATER-COOLED WORM-DRIVEN CHASE LINE**, the "one best bet" for both dealer and user, for flexibility, quality, durability and satisfaction.
- ¶ Our **NEW SELLING PLAN**, unusual and distinctive in the truck industry, whereby a dealer is **not** required to make large investments and deposits. A plan supremely worthy of your consideration!
- ¶ A motor-truck **RESEARCH DEPARTMENT**, conducted solely for the purpose of furnishing to dealers and agents concrete data on truck operation, thereby enabling them to analyze their prospects' transportation and delivery problems intelligently. Another advanced idea in helping the dealer.
- ¶ Continental Motors, Brown-Lipe Transmissions, Sheldon Axles, Bosch Magnetos, Hydraulic Pressed Steel frames—these are some of the high-class parts which make the **CHASE LINE** the embodiment of all that is desirable in motor trucks.
- ¶ Your territory may be open. Let us tell you about the **NEW CHASE LINE**. Write to-day.

Chase Motor Truck Company, Syracuse, N. Y.

 **THE PUBLISHERS' PERSONAL PAGE** 

*Be up to date,—past successes do not
remove present obstacles*

Uncle Sam Awakening

Our government is at last waking up. Signs of dawning appreciation, in the nature of actual money appropriations for motor-driven army vehicles, are making their appearance. The pessimists---those with mental indigestion ---have at last been brought over.

The recent small \$50,000 appropriation shows that the war has at last aroused Uncle Sam from his lethargy, and perhaps this marks the beginning of a systematic effort to apply commercial cars to army uses.

Needs of Post Office

The post-office department is even more sadly in need of motor vehicles to facilitate and bring up to date the mail service. This is clearly shown by the statement of W. H. Haycock, superintendent of mails, that in rural delivery, only ten per cent of 43,814 vehicles are automobiles, that less than five per cent of the 1700 vehicles used in the screen-wagon service are motor-driven, and less than one per cent of the 2485 vehicles in city delivery service are power-driven.

When it is realized that the entire mail service should, and eventually will, be motorized, and horses eliminated, the ludicrously small motor equipment of the mail service of Uncle Sam is made evident.

Officials Convinced

There is no question as to the ability of power trucks and delivery wagons to do the work, as shown by what they have done and are now doing for merchants throughout the country. The officials of the post-office department are thoroughly convinced, all they need is sufficient money to reorganize the service on a motor basis.

Autocar Coal Cars Prove Cheaper and Better Than Horses



Chesapeake Coal Company Found First Autocar So Good They Bought Another

THE ADAPTABILITY of the *Autocar* to every line of business is emphasized by this new type of delivery vehicle recently produced for the coal trade. By enterprising coal dealers the *Autocar* Two-ton Coal Car is being welcomed as a long awaited means to better and cheaper deliveries. The improvement it has brought to every concern that has compared it with horses has been immediate and astonishing.

A letter we recently received from the Chesapeake Coal Company, of Baltimore, Md., is a good illustration of this. The Company says:

"You asked us for an expression as to what we think of the two-ton *Autocars* which we are now using, and the comparison of them with that of the horse-drawn vehicle.

"We have been in the coal business about 15 years and have never used automobile trucks until recently, as we had learned from others in our line of business that the larger trucks were not a paying proposition, especially when operating over cobblestone streets and rough roads, as the cost of maintenance was too great. But after you came out with the *Autocar* two-ton

coal truck we decided to purchase one and try it out, as it was highly recommended to us by others, who said it was the ideal car for the coal business.

"We found our first truck a great saving over horse-drawn vehicles, and it proved entirely satisfactory in every respect. So we purchased a second car and expect to be in the market for more in the very near future, and eventually to displace at least two-thirds of our horse-drawn vehicles with *Autocars*.

"Our two cars have displaced from 6 to 7 two-ton wagons, which is equivalent to 12 to 14 head of horses. The cost of operating each car has averaged about the same as two double teams.

"The *Autocar* is as profitable on short hauls as on long hauls, as we will average on short hauls from 24 to 33 miles, delivering from 26 to 34 tons in nine hours; and on long hauls we will average from 40 to 66 miles, delivering from 18 to 26 tons in nine hours.

"We find the *Autocar* well adapted to the coal business, due to the fact that it can get through congested streets and small coal yards quickly and easily.

Autocar

"Used in Every Line of Business"

A new style high pitch dump body has recently been added to the *Autocar* Coal Car equipment. Write us for literature and a photograph of this body in action will be mailed to you. Address Dept. J.

THE AUTOCAR COMPANY, ARDMORE, PA.

Established 1897

Motor Delivery Car Specialists

The Commercial Car Journal

VOLUME VIII

PHILADELPHIA, FEBRUARY 15, 1915

NUMBER 6

MOTOR TRUCK EXPORTS GROW Nearly \$2,250,000 Worth Sold to France, England and Canada in November— Year's Car Exports Will Exceed Total of 1913

During November last the United States shipped abroad motor trucks having an aggregate value exceeding by more than half a million dollars the value of all trucks exported during the whole of 1913. The figures for November, just issued by the Department of Commerce, show that 842 commercial vehicles, valued at \$2,244,518 were exported, as compared with 672, worth \$2,286,964, in October; only 64 in November, 1913, valued at \$105,501, and a total of 1009, worth \$1,686,807, during the whole of 1913.

An analysis of the government report made by the National Automobile Chamber of Commerce indicates that exports of motor vehicles of all kinds for the calendar year slightly exceeded in valuation those of 1913. When the war threatened to cause a serious set-back, the purchase of trucks more than offset the decreased sales of passenger cars to foreign countries, and it is confidently expected that after peace is declared there will be a much larger foreign market for American passenger and commercial cars than ever before and also a larger home market for trucks.

France received 695 American motor vehicles last November, as compared with 87 in the same month of 1913, and England took 404, as against 321. Germany bought none, as against 69, and all other countries took fewer last November than the year before, with the exception of Bermuda and the West Indies, to which we shipped 84, as compared with 50 in that month in 1913.

A big decrease has occurred in exports of carriages and wagons. In the 11 months ended November 30 only 3348 carriages, valued at \$273,124, were exported, as compared with 14,190, valued at \$832,172, in the corresponding period the year before. In the same 11 months last year 15,084 wagons, worth \$1,236,452, were exported, as compared with 20,425, worth \$1,252,811, in the first 11 months of 1913.

WILLYS RETIRES FROM MOTOR TRUCK INDUSTRY

On January 13th, the Willys-Overland Company, Toledo, Ohio, disposed of its entire interests in the Gramm Motor Truck Company, of Lima, Ohio, by the transfer of its stock interests to the Geiger-Jones Company, of Canton, Ohio. By the terms of this transfer the Gramm Motor Truck Company will continue manufacturing both large and small trucks and will also take over the sales organizations both of the Willys Utility truck and the Garford trucks, heretofore manufactured at Elyria, Ohio.

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The details of the transaction are not made public, but it is said that the Willys interests are all transferred and that by their acquisition of the controlling interest in the common stock and their interest in the outstanding preferred issue of the Gramm Company, the Geiger-Jones Company have acquired full working control of the business. They will maintain their factory at Lima, together with sales and service stations in New York City, Brooklyn, Boston, Newark and Philadelphia, and will continue to use Overland dealers and distributors at various points throughout the United States and foreign countries where the truck business is already established, in addition to increasing their connections as rapidly as the development of the business will warrant.

Mr. Willys gives as his reason for disposing of the truck business that he considers it a business separate and distinct from the quantity production of automobiles and that the rapid growth of the Overland business has made it seem to him advisable to concentrate the efforts of the Overland or-

ganization on the main industry at Toledo.

The plant at Elyria, Ohio, heretofore conducted as a factory producing motor trucks, it is now stated, will be employed in the manufacture of Overland parts.

TRUCK CLUB HEARS ADDRESS ON SPECIAL BODIES

At the recent monthly meeting of the Motor Truck Club of America, in New York City, on January 20th, Chas. E. Stone, late general manager of the club, gave a short talk on special bodies for trucks working under special conditions. His address was illustrated by a number of slides showing the different types of bodies evolved for special work. F. M. Williams was to have read a paper on "Good Roads and Highway Construction in the United States," but at the last minute wired that he would be unable to attend; Mr. Stone then kindly volunteered his services. An interesting feature of the meeting was the presentation of a silver coffee set to former President Geo. H. Duck in recognition of his excellent work during 1914.

CHICAGO BARS HEAVY TRUCKS FROM STREETS

Some of the provisions of an ordinance drawn up recently in Chicago are that all motor trucks shall have rubber tires overlapping steel tires; weight of vehicle load shall not exceed 750 lbs. for each inch of width of tires; maximum weight load, 2800 lbs.; speed of trucks to be based on capacity and ranges from 6 to 12 m.p.h. Loads shall not project more than 4 ft. beyond rear end of machine except in the early morning and late at night. For excessive weights and loads, the ordinance provides for special permits to be issued by the Department of Public Works, bonds to be given to protect the city against damage to streets.

JERSEY TRUCK CLUB'S FIRST MEETING

The Motor Truck Club of New Jersey recently held its first meeting, at Newark, N. J., David Harper presiding. He addressed the meeting on taxation. In the course of his address he stated that the rates of taxation in New Jersey were exorbitant, that he had to pay from \$25 to \$37.50 each for his trucks, while in New York State the taxation would be about \$5; and that he had to pay twice for his trucks—first as motor vehicles, second, as personal property.

HOUSE PASSES ARMY BILL

The army appropriation bill was passed by the House on January 23rd. It carries funds for the maintenance of all branches of army work and includes \$50,000 for armored motor cars.

The CCJ has most advertisers because it gives them biggest returns

THE BUFFALO AUTOMOBILE SHOW

By GEORGE W. GRUPP



THE thirteenth annual automobile show held by the Buffalo Automobile Dealers' Association proved to be the best in the history of the association, not only financially, but in every particular. It was the most complete motor exhibition ever held in Buffalo under one roof, as it included not only the various automobiles, but also the leading commercial cars and motorcycles. The exhibition was staged in Convention Hall, which has a floor space of 45,056 sq. ft.

The hall was a Garden of Japan with its decoration of yellow and black trimmings beautifully draped. Japanese lanterns of various colors were suspended from the ceiling and lighted in the evening. The aisles were colonnaded and plaster parais cast statues of Japanese were placed here and there amid the columns. All of which gave it a very Oriental effect with artistic tones.

Among the exhibits at the show were the following trucks—Atterbury, Adams, Denby, Federal, Republic, Service, Signal, Stewart, Studebaker and E. R. Thomas.

Atterbury exhibited a two tons capacity chassis with driver's cab.

Adams displayed a two-ton chassis.

Denby staged a two-ton chassis.

Federal exhibited a two-ton worm-driven chassis.

Republic staged a one and a half ton chassis with a driver's cab; also one with a stake body.

Service displayed a one and a half ton chassis.

Signal staged a one and a half ton worm-driven chassis.

Stewart exhibited three 1500 lbs. capacity chassis. Panel body delivery express and canopy top body.

Studebaker displayed a panel body delivery truck.

E. R. Thomas staged a "Thomas Fire Apparatus," which is a triple combination fire fighter.

BOSTON GARAGE RULES

The garage men and dealers of Boston have won a victory inasmuch as the new rules governing garage construction, etc., which went into effect on January 15th, do not require separators, but they do require certain alterations in existing buildings and cover all new structures. All garage buildings in the metropolitan section will hereafter have to conform to the new rules, and in those now existing a few changes are necessary. Such changes must be made by June 1st.

PHILADELPHIA E. V. A. HOLDS FEBRUARY MEETING

The February meeting of the Philadelphia Section of the Electric Vehicle Association of America was held Wednesday, February 10th, at 12 noon, at the Hotel Colonnade. Mr. Stephen G. Thompson spoke on "Sensible Power Wagon Application." Extracts of this address will be printed in our next issue.

COMING AUTOMOBILE SHOWS AT WHICH COMMERCIAL CARS WILL BE EXHIBITED

February 13-20—Albany, N. Y. Armory. J. B. Wood, Treasurer, Albany Garage.
February 15-20—Bridgeport, Conn. State Armory. B. B. Steiber, Manager, 925 Main Street.
February 15-20—Tacoma, Wash. Auditorium.
February 15-20—Omaha, Neb. Auditorium. Omaha Auto Show Association. C. G. Fowell, Manager, 2115 Farnum Street.
February 15-21—Grand Rapids, Mich. Klingman Furniture Building, Grand Rapids "Herald." C. L. Merriman, Manager, care of Grand Rapids "Herald."
February 22-27—New Haven, Conn. Armory.
February 22-27—St. Louis City, Ia. Auditorium. R. E. Herrington, Manager, 310 Virginia Street.
February 22-28—South Bethlehem, Pa. Coliseum. J. S. Elliott, Manager.
February 23-27—Syracuse, N. Y. State Armory. Syracuse Auto Dealers' Association. H. T. Gardner, Manager, 100 Prospect Place.
February 23-27—York, Pa. Coliseum Hall.
February 23-27—Fort Dodge, Ia. Armory. Fort Dodge Auto Dealers' Association. G. W. Tremaine, Secretary, 1104 Central Avenue.
March 2-9—Brooklyn, N. Y. Twenty-third Regiment Armory. Charles Stewart, Manager, 360 Flatbush Avenue.
March 3-6—Watertown, N. Y. Watertown Automobile Association. Arthur E. Sherwood, Manager, 4-6 Flower Building.
March 3-6—Shelbyville, Ind. Geo. Morrison, Secretary, 411 S. Tomkins Street.
March 3-6—Fargo, N. D. Auditorium. W. M. Ball, Manager.
March 6-12—Boston, Mass. Mechanics' Building. Boston Auto Dealers' Association. Chester I. Campbell, Manager, 5 Park Square.
March 8-13—Des Moines, Ia. Coliseum. Des Moines Auto Dealers' Association. C. G. Van Vleet, Manager, 409 Observatory Building.
March 8-13—Canton, Ohio. Auditorium. W. A. Horderier, Manager, 208 Market Avenue, S.
March 9-13—Piqua, Ohio. E. Huntsinger, Manager.
March 10-13—Jamestown, N. Y. Armory. Chas. A. Harvey, Manager.
March 13-20—Harrisburg, Pa. Rexol Arena Building. J. Clyde Myton, Manager, Patriot Building.
March 15-20—Cedar Rapids, Ia. Auditorium. Cedar Rapids Auto Dealers' Association. Martin Beck, Manager, First Avenue, West.
March 22-27—Bangor, Me. Auditorium. A. P. Pierce, Manager.
March 22-29—Phoenix, Ariz. Armory. F. D. Gustin, Manager.
March 25-27—Bloomington, Ill. John Deere Building. C. C. Wagner, Manager, 1112 E. Grove Street.
March 29-April 3—Paterson, N. J. Auditorium. Robt. A. Mitchell, Manager, 187 Ellison Street.
April—Calumet, Mich. Coliseum.
April 15-20—Deadwood, S. D. Geo. H. Kilker, Manager, care of Deadwood Business Club.

AMENDMENT TO INDIANAPOLIS LICENSE LAW INTRODUCED

A bill amending the Indianapolis motor license law has been introduced into the Legislature, which provides for the annual licenses to be paid to county treasurers instead of State officials, and the money turned over to the townships directly for road improvements; it also provides a uniform license fee of \$5 a year, with the provision that the owner may hold the same license plate as long as he pays the annual fee. The present license fees are graduated according to horsepower. Electric vehicles are licensed uniformly at \$5 a year.

The E. F. Goodrich Company's net income for 1914 was \$5,440,000, after deducting depreciations and maintenance, as compared with \$3,549,429 for the preceding year. Of this amount, \$2,100,000 was paid out for dividends on preferred stock and \$900,000 was reserved for the retirement of preferred stock. The total surplus at the end of the fiscal year was \$3,177,400.

BOSTON TO BE SCENE OF FIRST LARGE TRUCK SHOW

Boston hasn't built a building large enough to house all of the motor car and accessory manufacturers that have applied for space to display their product at the Automobile Show which opens in Mechanics' Building on the evening of March 6th and concludes one week later. For a month past every inch of available space has been taken, and since that time Manager Chester I. Campbell has received almost a hundred applicants from pleasure car, truck and accessory manufacturers.

The abnormal demand no doubt is due to the fact that this year it will be a combination of truck and pleasure cars. The truck makers got on the job early and closed contracts for space and as a result many, many pleasure car makers have been forced out. Last year, when Mechanics' Building was given over to the trucks exclusively, there were only thirty-one makes on exhibition, while the list for the 1915 show has twenty-nine different exhibitors.

Another interesting phase of the Boston Show is the great number of accessory manufacturers new to the New England trade that will exhibit. Last year most of the accessories were displayed by local agents and jobbers. This year the manufacturers are making the display and the great majority of them are here for the first time. In the accessory department there will be twenty-four different makes of tires on exhibition. This does not, of course, include any of the large manufacturers that make up the "tire group."

Among the newcomers in the truck department will be the Rowe Motor Manufacturing Company; Necto Truck, of Fitchburg, Mass.; Vim Truck and the Robinson Fire Apparatus Company.

The list now shows sixty-five pleasure cars, four electrics and twenty-nine truck exhibitors. If Manager Campbell could find space for all the applicants the Boston Show for 1915 would smash all previous records.

BUREAU OF FOREIGN AND DOMESTIC COMMERCE OPENS BRANCH OFFICES

The Bureau of Foreign and Domestic Commerce has opened branch offices in the following cities: New York City, 409 United States Custom House; Boston, 752 Oliver Building; Chicago, 629 Federal street; New Orleans, Association of Commerce Building; San Francisco, 310 United States Custom House; Atlanta, 224 United States Post Office Building; Seattle, 1207 Alaska Building, where publications, samples of foreign-made products, plans and specifications of construction work, lists of foreign dealers in foreign lines, manuscript, consular reports and similar documents will be available to interested individuals or firms. Reserve addresses in connection with "Foreign Trade Opportunities" published in the consular reports may be obtained from this office.

United Fuel & Supply Company, Detroit, Mich., has purchased twenty-two Pierce-Arrow trucks. This concern was formerly the largest owner of horse equipment in Michigan.

Personal Items

F. E. Hexter has become supervising manager of the East for the Republic Truck Company.

W. C. Shansfelt, formerly western district supervisor of sales for the Studebaker Corporation, is now superintendent of territory.

Channing Parsons, production engineer of the Republic Motor Truck Company, Alma, Mich., has been appointed assistant superintendent.

Maurice L. Switzer has become advertising manager of the Kelly-Springfield Tire Company and will have his headquarters in New York City.

Garnet C. Brown, formerly connected with the Buffalo Electric Vehicle Company, Buffalo, N. Y., joined the engineering staff of the Packard Motor Car Company, Detroit.

Wm. Cairns, formerly general manager and sales representative of the Parish & Bingham Company, has resigned. The personnel of the company remains unchanged.

W. K. Ackerman, who recently resigned from the Standard Motor Truck Company, Detroit, expects soon to manufacture a heavy type of motor truck to be known as the Rhodia.

Thos. Reed, a competent and capable mechanical engineer, has been appointed by the Keystone Lubricating Company as supervisor of the territory formerly covered by Chas. Hopper, deceased.

S. E. Howard, of the General Motors Truck Company, Pontiac, Mich., has been sent to Europe as special representative of the GMC trucks, both gasoline and electric. His headquarters will be in London.

Frank V. Springer, for the last 10 years in charge of the railroad sales department of the Republic Rubber Company, Youngstown, Ohio, has been appointed manager of the London office of that company.

Clayton A. Eddy, formerly advertising manager of the Toledo Computing Scales Company, joined advertising staff of Studebaker Corporation, Detroit, and will also assist in editing the "Studebaker News."

Ralph Hestep has closed contract with the Packard Motor Car Company to handle advertising campaigns and to prepare its advertising copy. The work will be done through the Cheltenham Press, New York City.

E. W. Spencer, formerly superintendent of sales in the eastern district for the Studebaker Corporation, is now manager of the sales follow-up and sales promotion department, with headquarters at the Detroit factory.

E. A. Williams, formerly manager of the Gramm Motor Truck Company, Lima, Ohio, who was sent to New York later by the Willys-Overland Company, has returned to take charge of manufacturing of the Gramm concern.

Fred W. Spacke, president of The F. W. Spacke Machine Company, Indianapolis, Ind., died on January 19th, after an illness of a year. About 10 years ago he started The F. W. Spacke Machine Company, of which he was head when he died.

C. W. Findeisen has been made sales manager of the Findeisen & Kropf Company, manufacturers of the well-known Rayfield carburetor. Although the son of the president of the company, he has had to push his way forward by force of merit. He began work in the factory itself and has been thoroughly schooled in every department of this large business. For the past 4 years he has been in active charge of the factory sales and stepped naturally from there into full charge of all sales.

Herbert L. Connell, well-known secretary and treasurer of the Detroit Section of the S. A. E., and formerly engineer of the Commerce Motor Car Company, has joined the Engineering Faculty of the Central Continuation School, at Milwaukee, where he will develop an automobile testing laboratory.

Chas. E. Spencer has tendered his resignation as advertising manager of The Autocar Company, having been with that concern for the past 6 years. He will open an advertising service office in the Land Title Building, Philadelphia, which will also include writing on the subject of motor trucks.

W. A. Clare, formerly in the Research Department of the Burroughs Adding Machine Company and later with the Service Recorder Company in charge of motor transportation problems, has joined the ranks of the Chase Motor Truck Company, Syracuse, N. Y., and will have charge of the Dealers' Aid and Research Department, which was established by H. T. Boulden, who recently became general sales manager of the Chase Company.

Charles E. Poyer has been appointed assistant general sales manager of the Edison Storage Battery Company. Mr. Poyer has been with the Edison interests for about 4 years and for the past 2 years he has been manager of the House Lighting Department, and the rapid development of this branch of the business, both from an engineering and commercial standpoint, is attributable to his ability. His promotion will enable Mr. Wm. G. Bee, vice-president and general sales manager, to give more of his personal attention to the advancement of the electric vehicle field and permit closer co-operation with the vehicle and other manufacturers.



CHARLES L. DERRICKSON

The McQuay-Norris Manufacturing Company, of St. Louis, makers of the Leak-Proof Piston Ring, announce that they have appointed Charles L. Derrickson their general representative to travel the entire country. Mr. Derrickson will look after all territories, working in conjunction with the numerous branch offices in the United States and Canada. The growth of the business in this motor part has necessitated this special effort on the part of the Leak-Proof Piston Ring Manufacturers and exemplifies their progressiveness.

Changes and Factory News

Sternberg Motor Truck Company has changed the name on all models to Sterling.

Kelly Motor Truck Company, Springfield, Ohio, is erecting addition 50x240 ft. to its plant.

Republic Motor Truck Company, Alma, Mich., has increased capital stock from \$50,000 to \$250,000.

Titan Storage Battery Company, Newark, N. J., changed its name to the General Lead Batteries Company.

Mission Motor Car Company, Los Angeles, Cal., is planning a light delivery wagon with a capacity of 800 lbs.

International Harvester Company has added to its line a 1500-lb., two-cylinder, water-cooled delivery car known as Model E.

Continental Motor Manufacturing Company, Muskegon, Mich., is adding about 60,000 sq. ft. of floor space to its plant to enable it to take care of its increased business.

The F. & H. Wire Wheel Company, Columbus, Ohio, is moving its plant to Springfield, Ohio. This move is made on account of increased manufacturing facilities and other inducements.

Detroit Pressed Steel Company, Detroit, recently re-elected the following officers: H. B. Hoyt, president; H. L. Flinterman, vice-president and general manager; Edward D. Caulkins, secretary and treasurer.

Lauth Juergens Motor Car Company, Fremont, Ohio, has increased its capital stock from \$150,000 to \$250,000. This was made necessary on account of large contracts to furnish motor trucks to European countries now at war.

The Torbensen Gear & Axle Company, Newark, N. J., has licensed the Lauth-Juergens Motor Car Company, Fremont, Ohio, to make internal gear drive axles for use on the one and a half ton Fremont-Mais trucks.

The Bull Tractor Company, Minneapolis, Minn., has bought from D. M. Hartsough, inventor of the Bull Tractor, all his patents and interests applying in foreign countries including Canada. All tractors will be made in Minneapolis.

Whitwood Corporation, Weedsport, N. Y., manufacturer of the Whitwood motor truck, has decided to disorganize and discontinue business. All bills will be paid, and the corporation will terminate without any financial embarrassment.

Autocar Sales Company, 425 W. Nineteenth Street, New York City, has moved to building formerly occupied by the United States Express Company, with entrances from W. Twenty-third Street and W. Twenty-fourth Street, between Tenth and Eleventh Avenues.

Wells, E. C., Manufacturing Company, Fond du Lac, Wis., manufacturer of lighting, starting and ignition systems, has been purchased by Richard H. Mansfield, formerly secretary of the Cutler-Hammer Manufacturing Company, Wisconsin. He has retired from that company to take charge of the Fond du Lac concern.

Gearless Differential Company has moved its offices to 364 Woodward Avenue, Detroit. The capital stock has been increased from \$50,000 to \$75,000, and the following officers elected: Geo. D. Bailey, president; C. F. Ferguson, vice-president; E. O. Knight, secretary and treasurer. The directors for 1915 are: H. H. Bailey, Geo. Stroh, A. MacLaren and John Schrag.

Personal Items—Retail

Joseph J. Martin has joined the forces of the Federal Motor Truck Company, Detroit.

E. F. Bunker has resigned his position with the Perfection Spring Company, of Cleveland, Ohio.

Barton E. Weiber has been appointed manager of Cincinnati, Ohio, branch of the Firestone Tire & Rubber Company.

D. W. Chamberlin has been made manager of the Cleveland branch of the Kelly-Springfield Tire Company, 1896 Euclid Avenue.

D. C. Hathaway has been appointed a member of the sales staff of the Kelly-Springfield Tire Company, with headquarters in Cleveland, Ohio.

E. W. Wajder, consulting engineer, with offices at 805 Chamber of Commerce Building, Detroit, is now Detroit representative of the Cotta Gear Company.

Walter Schimf, inventor of the Schimf Air Starter and Index Primer, has become manager of the Saxon Motor Car Company's New York City service station.

A. W. Johnson has been appointed sales manager of Warner M. Bateman's Studebaker commercial car department, Sixteenth and Broadway, San Diego, Cal.

L. A. Mosker is now connected with the sales department of the Kearney & Trecker Company, Milwaukee, Wis., and is representing that company in Ohio.

L. C. Stevenson, manager of the factory sales follow up department of the Studebaker Corporation, is now assistant manager of the Minneapolis branch.

E. E. Taylor, Chicago branch manager of the Gibney Tire & Rubber Company, was formerly Chicago and Detroit manager of the Goodyear Truck Tire Department.

G. W. Tiffany, formerly connected with the truck tire department of the Goodyear Tire & Rubber Company, has joined the Gibney Tire Company, Detroit, Mich.

Robert Cartmell has been appointed general representative for the Kelly-Springfield Tire Company on the Pacific coast, with headquarters at 1110 S. Main Street, Los Angeles, Cal.

W. F. Koloroyd, formerly manager of the Chicago branch of the Polack Tyre & Rubber Company, is now with the Gibney Tire & Rubber Company, of 1712 Michigan Avenue, Chicago.

James Ryan, for the past 3 years Indianapolis representative of the Rayfield Carburetor, resigned his position to take up work with the carburetor division of the Detroit Lubricator Company.

Fred W. West, who resigned as manager for J. W. Leavitt Company, Portland, Ore., has accepted similar position with the Gerlinger Motor Car Company, of the same city, and is selling King pleasure cars and Federal trucks.

C. E. Williams, after being away from Portland, Ore., for two years, has returned to take the management of the Goodyear Tire & Rubber Company's branch in that city, succeeding Mr. McDermott, who has been transferred to Seattle branch.

Winfield E. Williams, consulting engineer formerly connected with the United States army, and later having a prominent part in reconstruction work in San Francisco, after the earthquake, is now manager of the Dallas branch of the Studebaker Corporation.

H. B. Kleckner, for twelve years with the Northern Machinery Company, Minneapolis, Minn., has resigned as secretary and opened salesrooms and service station at 1514 Hennepin Avenue, under the name of Kleckner Shock Absorber Company, handling the Velvet shock absorber.

New Agencies and Changes

Diesinger, Michael, N. Ninth Street, Lebanon, Pa., has taken agency for Dart trucks.

Heimer G. Haupt, Cleveland, Ohio, has taken the agency for the Milburn electric.

Bumsey, E. L., 21-S Selden Avenue, Detroit, has taken agency for Milburn electric.

White Motors Company of Kansas City, Mo., changed name to Scarritt Motor Car Company.

Goldman, E., & Sons, 82 Commerce Street, New Haven, Conn., taken Krebs truck agency.

Stimpeon, E. Y., 650 Beacon Street, Boston, Mass., has taken the agency for Milburn light electric.

Indiana Commercial Truck Company leased entire building at 245 W. Fifty-fifth Street, New York City.

West Coast Wagon Company, Tacoma, Wash., has secured the distributing agency for the Goodyear truck tires.

Behkopf Brothers, Topeka, Kans., have taken the agency in Shawnee, Osage and Wabunsee counties for GMC trucks.

Commercial Garage, operated by Century Garage Company, 121 S. Lafayette Avenue, South Bend, Ind., is being rebuilt—\$6000.

Gas & Electric Company, Baltimore, Md., agent for G. V. electric, has taken the agency for the GMC gasoline and electric trucks.

Louis E. Hysenman, 501 Empire Building, Thirteenth and Walnut Streets, Philadelphia, Pa., has taken the agency for the Republic truck.

Metropolitan Motor Company, 609 Tenth Street, Minneapolis, Minn., secured the distribution in the northwest for the Commerce truck.

Northern Rock Island Flow Company, 404 Washington Avenue, N., Minneapolis, Minn., has secured distributing rights for the Helder tractor.

Grasser Motor Company, Madison and Fifteenth Streets, Toledo, Ohio, moved to Madison and Eleventh Streets. The company has recently added the Dodge and Milburn electric to its line.

Milburn Electric Car Company, 2215 Spring Garden Street, Philadelphia, Pa., has been formed to handle the truck of the Milburn Wagon Company, Toledo, Ohio. Rodney S. Pullen is manager.

Globe Motor Car Company, Canton, Ohio, incorporated with a capital of \$100,000, to deal in motor cars and trucks. C. S. Lothamer, E. M. Raber, G. A. Marks, I. W. Royer and J. R. Bodine are the incorporators.

Moss, E. E. Company, 2718 Farnam Street, Omaha, Neb., has entered the automobile field for the purpose of handling trucks exclusively. Agencies have been taken for the Commerce, Federal and Standard trucks.

Lenox Garage, Lenox, Ia., sold out to Geo. Martin, who will operate same under name of Martin's Garage. He has also purchased half interest in the Overland agency and business will be conducted under name of Carter & Martin.

Cornelius Auto Sales Company, 809 Jefferson Avenue, Toledo, Ohio, has been taken over by Cornelius-Browning Auto Company. The new firm located at 817-19 Jefferson Avenue. At present Krit pleasure cars and Vim commercial cars are handled.

Shellett Company, Minneapolis, Minn., is occupying new garage and repair shop erected at 714 Eighth Street S. The main part of the building is 140x80 ft. and there is a well-equipped machine shop covering floor space 40x100 ft. This company makes a specialty of caring for trucks, its garage having capacity for about forty trucks.

New Incorporations

Steve Gilbert, formerly connected with the Gerlinger Company, has become manager of the commercial car department of the Oregon Motor Car Company, Portland, Ore.

Adams-Oakland Company, Cleveland, Ohio, auto trucks and accessories. Capital, \$55,000. Incorporators: H. M. Adams, A. A. Stearns, J. C. Royou, John A. Chamberlain, L. A. Kraus.

Pondelick Piston Ring Company, Chicago, Ill., has been incorporated with a capital stock of \$20,000 by L. & C. Pondelick and A. A. Landry, to manufacture metallic piston rings, machinery and motors.

Burd High Compression Company, Rockford, Ill., has been incorporated with capitalization of \$50,000 for the purpose of manufacturing piston rings, machinery, tools, appliances, etc. A. A. Hyer is attorney for the company.

Hub Motor Truck Company, Columbus, Ohio, has incorporated with a capital of \$300,000 to manufacture and deal in all kinds of vehicles to be propelled by horse, electric, steam, gas, compressed air or other power. T. C. Hanly, John L. Herpich, John B. Baas, R. Wilke and John J. Chester are the incorporators.

Radfix Manufacturing Company, 29 Broadway, New York City, radiator compound, has been succeeded by the Radiator-Fix Company, Inc., which is engaged in manufacturing and marketing a chemical preparation under the registered name of "Radfix." The officers are: Wm. A. Harrison, president; Harry G. Payne, first vice-president; Robert H. Armstrong, second vice-president; Clayton S. Galbraith, secretary, and Chas. G. Galbraith, treasurer.

Interstate Automobile Safety Fender Company, Columbus, Ohio, has been organized with a capital stock of \$10,000, to manufacture and sell fenders for motor trucks under patents held by the Automatic Safety Fender Company, of Chicago. The company will cover Ohio, W. Virginia and Kentucky. Offices have been opened in Room 74, Ruggery Building, Columbus. The officers are: J. V. Morgan, president; J. B. Moore, vice-president; E. K. Kinnison, secretary, and Peter Napier, treasurer.

Utah County Transportation Company has started an auto stage line between Provo and Payson, Utah.

Association of Spark Plug Manufacturers held an informal luncheon at its annual meeting on January 8th at the Hotel Biltmore, New York City. Due to the pressure of outside business on the part of several active members, it was impossible to carry through the regular program, and another meeting was held on January 27th at the Congress Hotel, Chicago, where the annual business for the year was transacted.

Hess, G. B., Brass Company, Detroit, Mich., advises that the fire which recently occurred at its plant, while it caused a considerable loss, did not extend to all parts of the plant. The foundry, power plant and a portion of the machine shop are well intact, and the resumption of this portion was only a question of time for the insurance company to adjust the loss. This portion of the plant was put into operation on February 8th, and such portions as were unable to be started, were located in some other building nearby. Additions, which have been planned for some time, will at once be made to the factory.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

MOTOR TRUCKS WILL RELIEVE CONGESTION

Superiority Over Horse-Drawn Vehicles Plainly Shown by Study at Railroad Terminals, Made by Boston Chamber of Commerce

"Development of the motor truck, which is coming more rapidly into general use, will, in our opinion, tend to relieve congestion by moving all kinds of merchandise in larger units and more rapidly," says a committee of the Boston Chamber of Commerce in a detailed report on street traffic in the Hub as the result of a year and a half of study of conditions.

"The ease with which motor vehicles can be handled and the fact that they occupy less space than horse-drawn vehicles are also distinct advantages. A careful study of the use of motor vehicles, made at the railroad terminals, plainly showed the superiority of the former. The average speed of the motor vehicles was found to be from two to three times as great as that of horse-drawn vehicles. Yet the motor truck is in its infancy and it is impossible to forecast the extent of this development.

"The number of motor trucks licensed in 1912 (in Boston) between January 1st and May 15th, was 2500. During the same period of 1913 the number of such cars licensed was 4400."

Big Jump in Truck Exports

In December last the value of motor trucks exported from the United States was more than double the total value of all such trucks exported in the whole of the year 1913. The figures for last December, as reported by the Department of Commerce to the National Automobile Chamber of Commerce, are: 1279 commercial automobiles, valued at \$3,387,729, as compared with eighty-eight, valued at \$100,660 exported in December, 1913, and 1009 valued at \$1,686,807, exported in the 12 months of 1913.

Passenger cars exported last December numbered 1297, worth \$998,698, bringing the total motor vehicle exports for the month to 2576, valued at \$4,386,427, as compared with 2389, worth \$2,152,144, in 1913, and 2013 worth \$2,060,812 in 1912.

MIDGLEY NON-SKID TIRE AGAIN BEING MANUFACTURED

The Midgley Tire and Rubber Company has opened its new plant at Lancaster, Ohio, and will now manufacture the Midgley non-skid tire, which was formerly manufactured by the Hartford Rubber Works, but which for some time has been off the market due to patent litigation. Basic patent rights on this tire have been bought by Harry Davis, a well-known theatrical manager in Pittsburgh, Pa., who is president of the concern, and Thos. Midgley, who first successfully made this tire, and who was formerly president of the Hartford Rubber Works, is vice-president. He recently resigned his position as consulting engineer for the United States Tire Company to join the new concern. The tire will be manufactured in the plant of the Ohio Flint Glass Company, which was bought last spring by Pittsburgh capitalists, and which contains about 4 acres of floor space. The company is capitalized at \$100,000.

Conventions of Interest to the Trade

The list of conventions given herewith is published each month, so that commercial car manufacturers can communicate with the proper authorities, with the idea of arranging to give lectures, illustrated talks, statistics, etc., to show the advantage of motor trucks in these various lines; also, possibly, to show and demonstrate their cars.

National Conventions

March 9-11—at Mason City, Iowa. National Creamery Buttermakers' Association. M. H. Meyer, 1911 West Washington Avenue, Madison, Wis., Secretary.
August 5-6—at San Francisco, Cal. National Top Notch Farmers' Club. Address Convention League.
March 6-13—at New York City. First National "Made in the U. S. A." Industrial Exposition. Grand Central Palace.

State Conventions and Fairs

February 17-18—at Pittsburgh, Pa. Retail Lumber Dealers' Association of Pennsylvania. Hotel Henry. Address Chamber of Commerce.
February 17-19—at Fargo, N. D. Annual Convention of North Dakota Hardware Association. C. N. Barnes, of Grand Forks, is Secretary.
February 19-22—at St. Louis, Mo. Retail Hardware Association and Mississippi Valley Implement and Vehicle Association Annual Convention. F. X. Beeherer, Secretary, 613 1/2 North Broadway.
February 22-24—at Boston, Mass. New England Retail Hardware Association. Mechanic Building, Huntington Avenue. George A. Fiel, Secretary, 176 Federal Street, Boston, Mass.
February 23-25—at Lexington, Ky. Retail Hardware and Stove Dealers' Association to convene. Headquarters are at Phoenix Hotel. J. M. Stone, of Sturgis, Ky., Secretary.
February 23-26—at St. Paul, Minn. Retail Hardware Association of Minnesota. H. O. Roberts, Metropolitan Life Building, Minneapolis, Secretary.
February 23-26—at Lincoln, Neb. Federation of Nebraska Retailers. Lindell Hotel. A. V. Pease, of Fairbury, interested.
February 24-25—at Fargo, N. D. State Lumbermen's Association. In Auditorium. F. C. Potter, of Cooperstown, is President.
March 1-2—at Dayton, Ohio. Ohio Laundrymen's Association. Algonquin Hotel. O. W. Holmes, Toledo, President.
March 2-4—at Huntington, W. Va. Retail Hardware Association. Armory. A. A. Doak, Secretary, Grafton, W. Va.
March 2-5—at Mitchell, S. D. Retail Hardware Dealers' Association. Meetings in Elk's Hall. Exhibits in Auditorium of the City Hall. E. C. Warren, Secretary, Pierre, S. D.
March 10-11—at Scranton, Pa. Pennsylvania, New Jersey and Delaware Grocers' Association. Address Alvin M. Graves, 690 Bourse Building, Philadelphia, Pa.
March 16-18—at San Francisco, Cal. State Retail Hardware Association. Address L. R. Smith, 561 Sixteenth Street, Oakland.
April 13-15—at Houston, Tex. Lumbermen's Association of Texas. J. L. Thompson, Chairman of Committee.
April 20-23—at New Orleans, La. Twenty-sixth Annual Convention of American Hardware Manufacturers' Association. St. Charles Hotel. Headquarters of Association at Woolworth Building, New York City.
May 6-8—at Macon, Ga. Georgia Retail Hardwaremen's Association. Address Chamber of Commerce.
May 8-18—at Austin, Tex. Fourth Annual Merchants' and Manufacturers' Exposition. R. F. Bacon, Chairman of Committee of Retail Merchants' Association.
May 11-13—at St. Petersburg, Fla. Retail Hardware Association. G. E. Noblit, Tarpon Springs, Secretary.
May 12-14—at Atlanta, Ga. Southern Wholesale Grocers' Association. J. H. McLaurin, of Jacksonville, Fla., President.
June 7—at Reading, Pa. One week. Industrial Exposition. Address Industrial Committee, Chamber of Commerce.
July 13-16—Ile of Palms, Carolinas Retail Hardware Association Convention. T. W. Dixon, Secretary, Charlotte, N. C.
August—at Reading, Pa. Retail and Wholesale Liquor Dealers' Association. Address Publicity and Convention Bureau of Chamber of Commerce.
August 10-13—at Whitney Point, N. Y. Broome County Agricultural Society Fair.

August 31-September 3—at Lowville, N. Y. Lewis County Agricultural Society Fair.
September 6-10—at Rutland, Vt. Rutland County Agricultural Society. W. K. Farnsworth, Secretary.
September 15-18—at St. Cloud, Minn. Benton County Fair Association.
September 18-25—at Kansas City, Kan. State Fair. A. L. Sponsler, of Hutchinson, Secretary.
September 21-23—at Waterloo, N. Y. Seneca County Agricultural Society Fair.
October 18-23—at Raleigh, N. C. North Carolina State Fair. Edgar B. Moore, of Charlotte, President.
October 23-30—at Beaumont, Tex. Southeast Texas Fair Association. C. R. Bone, Secretary.
November 30-December 2—at Cedar Rapids, Ia. Implement Dealers' Association. C. F. Roemer, of Hampton, Ia., President; E. P. Armknecht, Donnellson, Secretary.
November 3-5—at Shreveport, La. State Fair.

Firemen's Convention

July 13-15—at Petoskey, Mich. State Firemen's Association. A. P. Lane, of Ithaca, Mich., Secretary.

Financial and Legal

Howe Engine Company, Minneapolis, Minn., manufacturer of fire apparatus, is in hands of Russel T. McFall as receiver. Business is to be conducted with a view to placing the company on its feet again.

Ideal Steel Wheel Company, Elkhart, Ind., is in hands of E. A. Skinner, as receiver. This action was taken on petition of Carter Jessup, a stockholder, who stated that threatening litigation might prove disastrous to the company.

United States Carriage Company, Columbus, Ohio, is in the hands of President Fred C. Myers, as receiver under bond of \$50,000 on application of Mrs. Katherine Myers, wife of the president, who holds a note for \$6000 against the company and fears that the assets will be lost if other creditors are permitted to take action.

Standard Motor Truck Company, Warren, Ohio, involuntary petition in bankruptcy has been filed by the following: Peterson Linotyping Company, \$500; Hossicker Company, \$143; Spear Mills Knight & Godfrey, \$100.00. On January 23d, a voluntary petition in bankruptcy was filed by C. W. Moody, individually, former president of the company.

LARGE BUILDING BEING ERECTED FOR TRUCK INTERESTS AT PANAMA-PACIFIC INTERNATIONAL EXPOSITION

The Panama-Pacific International Exposition management announces that a separate building is being erected for the exclusive housing of motor truck exhibits. It had been originally intended to place the truck displays in the Palace of Transportation with the pleasure car exhibits, but the demand for space for other exhibits was so great that comparatively little space would have been available for commercial car interests. The building being erected east of Machinery Hall, will be one-story in height and have 54,650 sq. ft. of space available for commercial car exhibits.

In connection with this exhibit, there will be installed in all probability a large testing laboratory. In this laboratory will be carried out a series of exhaustive tests covering every portion of manufacturing processes, the testing of the various steels and alloys in chassis and motor construction, the standardization of the thousand and one parts which enter into the makeup of the modern machine.

METROPOLITAN SECTION, S. A. E. JANUARY MEETING

Discussed Effects of the War on the Automobile Industry



AT a well-attended meeting, January 28th, of the Metropolitan Section of the Society of Automobile Engineers at the Automobile Club of America, the subject of the effect of the war on the automobile industry was discussed by the members.

A. Ludlow Clayden, former editor of the *Automobile Engineer of London*, and John R. Eustis, motor truck editor of the *New York City Evening Mail*, supplied the papers of the evening. Mr. Clayden, who has come to this country to make it his home, spoke on the opportunities for the sale of American cars in Europe as a result of the war. He said, "Huge numbers of automobiles of all kinds and sizes, both pleasure and commercial, are being literally consumed by the armies, and will have ceased to exist absolutely by the time the war is ended. All Europe will be greatly impoverished and it will take the work of a generation or more to pay the stupendous bills that are being piled up by each of the belligerent nations. Victors and vanquished alike will have to apply the whole energy of their people to repairing the damage to their national exchequers."

He said that at the close every effort will be made to get back to the usual footing, and that the demand for automobiles will be so great that the English factories cannot supply it especially for low-priced vehicles. He also stated that England looked to America to supply the demand for such vehicles, and that her makers were unable to manufacture cars of equal worth at prices which would compete with the quantity production product of the American makers.

Suggests Foreign Types

He suggested that special designs be made for the foreign market, these to cater more definitely to the European taste for low hung bodies, right side steering, etc. He called attention especially to the European dislike for the racing type mudguard, almost universally supplied on American cars. Other suggestions were that owing to the good roads the clearance could be less, the motors smaller, and of high speed with a four-speed gear box, and that high-speed hill climbing ability was not required. He asked if it were not possible for American truck makers to get out a one-ton truck at \$1000.

A long discussion followed, taking up the various points; many questions were

asked as to the foreign practice connected with dealers' discounts, the methods of rating to take care of overloading. At this point it was brought out that trucks would stand more overloading owing to the smooth European roads, and that therefore the ratings might be slightly raised on cars shipped to England. The subject of shipping knocked down, and assembling of chassis abroad and having foreign bodies fitted, the attitude of the European trade in regard to metal bodies such as used in this country, and many other subjects were discussed.

Trucks in War by Slides

The rest of the evening was made most interesting by John R. Eustis, who gave extracts from his lecture on trucks in the war, illustrated by a large number of lantern slides. Every phase of the situation was brought out, showing that as much depended upon the explosion of gasoline as of powder in this most modern warfare. He stated that the first turning back of the German advance was directly due to the throwing suddenly into the field of 70,000 troops carried by taxicabs which were gathered up hurriedly in and about Paris, and that in many other places the decisive action was brought about by forces suddenly placed in the right position, which would have been impossible without motor vehicles; in fact, modern strategy has been revolutionized by the use of motor-driven vehicles. Ambulances, movable hospitals, kitchens, aerial ladder, aeroplane fighting machines, motor vehicles which are convertible into forts, water sterilizing plants, bread and meat wagons, and methods of quickly converting pleasure cars into ambulances or vehicles of war were all shown on the screen.

FEDERAL DEALERS' CONVENTION

On January 20th, Federal dealers from all over the country attended a dealers' convention at the Detroit factory. At this meeting a new worm drive, three and a half ton model, was announced with the price at \$2800, the one and a half ton price being reduced to \$1800. The first day was taken up by a business session, the dealers being company guests at the best show in town that night. After business sessions and a trip to the Timken plant on the second day, the dealers attended the Detroit Auto Show in a body, in the evening. The third morning was devoted to an inspection of the new model Federals and the afternoon to a summary of the convention. That evening a big banquet at the Pontchartrain ended the meeting. Cabaret was plentifully sprinkled through the feast.

DRUG CONCERN TRIES NEW TRUCK PLAN

Sell Driver Truck and Pay Him for Its Use

The McPike Drug Company, of Kansas City, is trying out a new scheme with its motor trucks. It is a co-operative plan between the truck driver and the company. This plan was adopted several months ago after some careful figuring to obtain greater efficiency.

The driver buys the truck from the company by a series of monthly payments, and thereby becomes responsible for the upkeep and maintenance, and incidentally assumes all worries. He also looks forward to future profits when he pays out on the truck, and to extras that he may pick up in hauling for others.

This is a new scheme for Kansas City, and users of motor trucks are watching results carefully. So far both driver and company are well pleased with the plan.

Here is the plan: The driver is started out with a new truck. He is given \$250 a month, which is what a similar truck has been costing the company. Half of this sum, \$125, the driver pays back to the company until the truck is paid for. The remaining \$125 represents his salary of \$60, and \$40 for his helper. The remaining \$25 is for repairs, oil and gasoline.

The benefits, as explained by A. G. McPike, vice-president of the company, are that all troubles are passed on to the driver. He will take especially good care of the truck, for as soon as he has paid out on it, he will have a bonus of \$100 a month. That gives him something to work for, and prevents careless driving, which reduces the life of a truck. The possible life of the trucks is 4 or 5 years under proper handling. He will pay out on the truck in less than 3 years, and the balance of the life of the truck will be velvet for him at the rate of \$100 a month. This plan has, during its 7 months' trial, shown repairs less than \$10 all together.

When the driver has paid in two-thirds of the price of the truck he is allowed to do extra hauling on his own account with it. Every other morning he is off until 10 a.m., and can use that time on his own work. Sundays he can use the truck for picnic parties.

When the truck is worn out the driver can buy a new one, or, if he has not the money, the company will trade in the old one on a new truck and sell it to him under the same plan as at first.

The price of \$250 a month is just what the company could hire a hauling company to do the work for.



Federal Dealers Lined Up Outside of the Factory, Detroit
From all over the country they came to inspect the new worm-drive Federal

The CCJ has most advertisers because it gives them biggest returns

THE COMMERCIAL CAR JOURNAL

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THE U. S. TRUCKS FOR WAR PURPOSES

 IN our July 15, 1914, issue, just before the European war broke out, we ran a leading article on the truth about trucks in the service of Uncle Sam for war purposes. This was largely in the nature of a criticism, showing the economical uses even in times of peace that the army could make of motor-driven vehicles, and the fact that very few trucks had been put in this service.

There seemed to be no systematic effort to introduce motor transport into the army, and although the methods of the army are usually very orderly, there seemed to be no system whatever of handling the trucks already in use.

Our interviews with heads of departments and those in charge of the purchase of trucks, showed that the government was very backward in appropriating funds. It is, therefore, with pleasure that we note that the recent army appropriation bill, recently passed by the house, carries with it a budget of \$50,000 for armored motor cars. This, of course,

is a very small amount of money when put into army equipment of this nature, but it is at least a start, and indicates perhaps a change of heart on the part of those in control at Washington.

If the present conflict in Europe has done anything it certainly has demonstrated the value of motor-driven vehicles for army use.

THE "JITNEY" 'BUS MOVEMENT



ELSEWHERE in this issue will be found some articles on the subject of the industry which has recently sprung into existence known as the "Jitney" 'bus business. The 5-cent 'bus that is sweeping the country, apparently in an irresistible manner, has caused no end of discussion in the automobile trade as to its possibilities and probable future, while it is creating among traction companies fear, antagonism and adverse legislation.

We believe that the "Jitney" 'bus business is the natural outgrowth of the desire of the public for quick and cheap transportation, of their desire to ride in an automobile, combined with the fact that many men were unemployed and could obtain cars of one kind or another at very reasonable prices.

The "Jitney" business improperly cared for, with no system of regulation as yet, and largely operated by men who have not been figuring automobile costs, will doubtless result in worn-out machines and operators that have not earned sufficient to replace them.

A few owners are going at this new service more systematically, organizing companies attempting to operate on schedule, and choosing routes with a maximum number of passengers, minimum length of haul, and over the best pavements. Some of these will succeed.

As a development in cheap transportation, the "Jitney" 'bus is certainly worthy of notice, and will, in all probability, lead to the establishment of permanent 'bus lines on some basis that will yield to their promoters a fair profit, and to the public a comparatively cheap and rapid transportation service.

LOW-PRICED ELECTRIC DELIVERY VEHICLES NEEDED



IT is a surprise to many that the electric vehicle industry has supplied but 3 per cent. of the vehicles now on the market. The economy and utility of electric delivery cars is well known among those business men who have used them and by those connected with the industry. The question is therefore often asked, why are not more electric delivery wagons used? This can be answered in two ways: those unfamiliar with delivery by electrics are afraid that they will be unable to cover the required distances, or that they may occasionally have to be towed home, and because electrics are so expensive initially, the first cost being so high as compared with gasoline trucks of the same capacity that business men in larger numbers will not buy them.

When it comes to low-priced vehicles many of which of gasoline type are now coming on to the market, there are none of electric type or have been none until the advent of a recent \$875 electric in New York.

If the electric vehicle industry expects to increase this 3 per cent. to 20 it must put on the market cars of similar

The CCJ leads in circulation, advertising and prestige

capacities to the gasoline trucks and at somewhere near the same prices.

Whether it is possible to build electric delivery vehicles that will stand up in service, and build them cheap enough to get into the many-user-class is a question which must be worked out by the makers. The entry into this field of at least one well-equipped maker is an indication that he at least

believes the low-priced electric not merely a future possibility, but a present reality, and is standing by his convictions.

There is room in this field for more makers, and the larger the number that go into it with proper preparation, and turn out vehicles that perform, and at prices under \$1000, the sooner the field of the electric vehicle will expand beyond its present 3 per cent. limits.

Steel and Rubber Markets

STEEL EXPORT SALES NORMAL

Throughout the steel industry better business is being reported. Railroads have ordered 416,000 tons of rails since January 1st, but few car, locomotive or bridge contracts have been closed. Contracts for 285,000 tons for domestic roads are pending, half of which are expected to be closed this month. The United States Steel Corporation reports that exports are nearing normal volume, 70,000 tons having been shipped during the first week of February. This includes shrapnel, wire, billets, sheet bars and rolled products. Quotations on February 9 were:

STEEL PRODUCTS PRICES

Bessemer Steel, per ton, mill.....	18 50	a19 50
Open hearth, per ton, mill.....	18 50	a19 50
Sheet bars, per ton.....	19 50	a20 50
Steel bars, soft base, half ex-tidewater.....	1 26	a...

The above prices are at tidewater in carloads and larger lots. For quantities less than 2000 lbs., but not under 1000 lbs., \$2 per ton additional is charged, and less than 1000 lbs., \$3 per ton additional.

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots \$2 per ton higher.

Gage—	Black	Galvan- ized.	Gage—	Black	Galvan- ized.
Nos. 22-24	1 65	2 55	No. 28	1 80	3 00
Nos. 25-26	1 70	2 70	No. 29	1 85	3 05
No. 27	1 75	2 85	No. 30	1 95	3 30

IRON AND STEEL AT PITTSBURGH

Bessemer iron	14 40	a14 70
Bessemer steel, f. o. b. Pittsburgh.....	19 50	a20 00
Skelp, grooved steel.....	1 10	a 1 15
Skelp, grooved iron.....	1 50	a...
Ferro-manganese (80 per cent.), seaboard.....	68 00	a70 00
Steel, melting scrap.....	11 50	a11 75
Steel bars	1 10	a 1 15
Black sheets, 28-gage.....	1 75	a 1 80
Galvanized sheets, 28-gage.....	2 90	a 2 95
Blue annealed, 10-gage.....	1 30	a 1 35

RUBBER PRICES DROP

Following the lifting of the embargo on rubber by the English Government, high-grade Para rubber immediately dropped from 70 to 66 cents per lb. At the time of this writing prices are 58 a 59 cents. Trading is being restricted to small lots. It is reported that the United States Tire Company has adjusted its prices as of February 1st, so that there will be less disparity between the prices paid by the dealer and those paid by the consumer, giving the latter the benefit. Similar reductions have been made by the Goodyear and Goodrich companies. The American Consul at London reports that the value of the rubber shipped from London to the United States during January, 1915, was \$2,884,381, against \$2,963,611 in January last year. Quotations on February 9th were:

Up-River—			
Fine	58	a	..
Coarse	44	a	45
Island—			
Fine	52	a	53
Coarse	28	a	29
Cameta	30	a	31
Caucho Ball—			
Upper	45	a	46
Lower	Nominal		
Centrals—			
Corinto	43	a	..
Esmeralda	43	a	44
Gautemala, slabs.	42	a	43
Mexican—			
Scrap	43	a	44
Strips and scrap	43	a	..
Guayule			
Salats—			
Sh't	50	a	51

Ciudad—			
B'k	a		..
Trinidad—			
B'k	Nominal		
Africans—			
Red C'go	Nominal		
B'k C'go	a		..
Soudan—			
Niggers	Nominal		
Gambia, prime.....	a		..
East India—			
Smk, sh'ts	62	a	65
Ceylon—			
Bls sheets	60	a	..
Pale crepe	60	a	61
Fontaine—			
Prime plantation ..	a		..
Palembang			
..	a		..

DOMESTIC SCRAP RUBBER

Tires—			
Automobile	5	a	..
Bicycle, pneumatic	3	a	3 1/4
Wagon and carriage, solid.....	5	a	..

THE "BEST SERVICE PLAN" FOR COMMERCIAL CARS

To give the owner satisfactory use of his commercial car during the daytime, the Best Service Truck Company, 1112 N. Twelfth Street, St. Louis, Mo., has inaugurated a unique service plan for truck users of that city. The introduction of a similar idea in other cities should help the commercial car industry.

For a fixed charge, the company performs all garage duties and repairs with the exception of those repairs caused by broken or worn parts, necessitating making, re-babbiting, scraping or taking upon bearings, or damage resulting from collision or careless driving. The chauffeur turns in a report at the garage of what he has noticed about the truck during the day. After investigation,

an inspector directs the mechanics to do such work as is required to place the car in perfect running condition.

The service duties are very comprehensive, and include cleaning carbon from cylinders, grinding valves, adjusting valve push rods, adjusting clutch, wheels removed and bearings looked into at short intervals, transmission gear and differential looked into regularly, adjusting chains, magneto and brakes, tightening bolts and nuts—preventing wear on other parts, tightening spring clips, cleaning and adjusting spark plugs, filling and turning up grease cups, radiators drained and washed out, crank case cleaned and washed out with a cleaning agent, crank case bottoms taken off and bearings examined, carburetors taken off and cleaned and kept adjusted, water pump adjusted, oil pump

cleaned and well adjusted, universal joints regularly inspected and greased, oiling every movable part to insure perfect working conditions, washing, polishing brass, and keeping engine well cleaned.

THE AUTOMOBILE HEARSE

Oh, Death, where is thy sting?

By jing!

With this new-fangled motor hearse, It's not so worse.

Its chauffeur is the good old pal Who put the "fun" in funeral.

Electric funerals? Great Scott!

But then again, why not?

So save your money, children, save,

And have a joyride to the grave.

Oh, Death, where is thy sting?

Giddap! Buzz-buzz!

Ding-ding.—*Detroit Journal.*

"Service"---the factory mark of superiority

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?

The "Jitney" 'Bus: Its History and the Part It is Now Playing in Transportation

By E. S. FOLJAMBE

SLANG phrases are often incorporated into our language, and become standard by usage. The sudden, mushroom-like growth of the "jitney" 'bus is fast incorporating the word "jitney" into our language. These 'buses are, in short, merely automobiles, or regular passenger carrying motor 'buses, which are used in many of the cities of the Middle and Far West, and also in the South in competition with the street car lines, carrying passengers for a 5-cent fare. "Jitney" is the showman or "barker" slang for a nickel. In some places it is commonly used with that meaning, so any self-propelled vehicle used in 5-cent passenger traffic is now spoken of as a "Jitney 'Bus," and already in certain sections simply as a "Jitney."

The Origin

Like the origin of many other movements, the exact beginning is somewhat of a mystery, although it is generally conceded that the Jitney 'bus originated in Phoenix, Ariz., about a year and a half ago, to relieve a street car tie-up caused by a strike. The first 'bus is said to have been put into operation there on June 29, 1913. For almost a year a few 'buses were operated, but the movement did not spread until about four months ago, when suddenly and without warning individual small car owners in different cities widely distributed, but especially in California, began to offer passenger service at 5 cents a head.

Not over four months ago these 'buses, without any warning, made their appearance in Long Beach, Cal., and like wildfire have spread over Southern California, Los Angeles being one of the cities most afflicted. San Francisco is also numbered among the Jitney 'bus cities, and it is claimed that at least one thousand will be in operation at the beginning of the Panama Exposition.

Sacramento traction officials, at a recent meeting, reported heavy financial losses, and claim that they have laid off four hundred men because of Jitney competition. Three California railroads are said to have appealed to the California Railroad Commission for concessions on account of inroads on their profits from Jitney 'buses.

Seattle has lines in direct competition with nearly all the street car lines of the city. Chicago has its 'buses, and the movement has already started in Detroit. In Denver the street railway company has taken steps to try to induce the Council to prohibit the use of the 'buses. Houston, Texas, has had 'buses in operation somewhat over two months, and the railroad companies report heavy losses from the competition.

Whether lack of employment has had anything to do with the surprising growth of the Jitney 'bus, as run by individuals, is not and probably will not be known, but it is certain that a large number of cheap, second-hand automobiles, some of which

have been fitted with 'bus bodies to accommodate from 10 to 12, are being operated by men who are out of employment. Conversation with them develops the fact that they are not entirely satisfied; some think that they are making money, while others claim that the competition is already so keen that there is nothing in it. There seems to be as yet practically no organized body in any of the cities operating the 'buses, although one or two cities boast of an association which takes in individual owners of 'buses by paying a small fee.

The various city councils have been taken by surprise, and no systematic rules or regulations seem to be in force. In many cities there is even no license charge for



Improvised "Jitney"

Small trucks have had the tailboards made rigid, and from this, on iron hangers, has been placed a rear step, while seats have been arranged, picnic-wagon fashion, on either side. A painted sign on the canvas sides indicates that the car is a public jitney. Of course, it goes without saying, that such a service with such accommodations cannot endure after the novelty has worn off.

operating a Jitney. However, active steps are being taken in all of the cities where 'buses are in operation to regulate the traffic. Detroit has just forced the drivers to pay \$10 each in accordance with an old city ordinance.

In Seattle, Wash., a scheme was on foot for issuing half-fare tickets for school children, while many of the 'buses take children under 3 years of age free.

'Buses of Miscellaneous Character

Almost every kind of a vehicle, from a Ford carrying five to a truck chassis fitted with a 32-passenger 'bus body, are to be found in the different parts of the

country operating as Jitney 'buses. Many of these are second-hand cars, which are not in the best of condition, and it is certain that they are not being kept up as they should be. The diversity of opinion as to the field and the possible future of the Jitney 'bus business is very marked, but it seems to have sprung into existence as an expression of the demand of the people for a cheap automobile service.

Dealers For and Against

Dealers in second-hand cars are in favor of Jitney 'buses, as through the new transportation scheme they have sold many of their old cars. Those handling light trucks have also sold vehicles for this purpose, while a few dealers have figured that it is not a paying business and have refused to sell for this purpose, at least on time payments. Dealers in large trucks are nearly all against any service at a 5-cent rate.

Public Favors Them

It is not surprising that large numbers of people are willing to patronize the Jitney, even standing on the running board when they could sit down in the street car for the same money. It is a new experience to many. It is a novelty, and as many of the Jitney 'buses take on at the outskirts of the city a load of the passengers desiring to go into the center, the service is practically an express service without stops, and is therefore faster than the street cars.

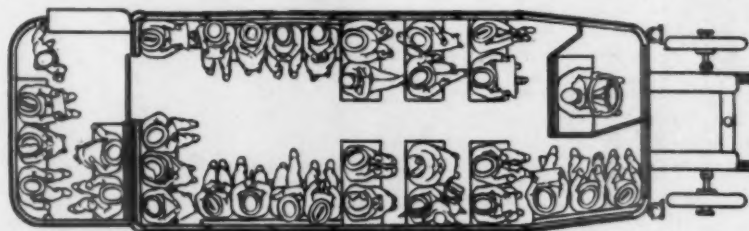
Body builders have in a few instances catered to the Jitney 'bus owner, supplying eight- and ten-passenger bodies to replace ordinary touring car bodies.

In Los Angeles and several of the California cities, statistics show a tremendous increase in automobile accidents, largely due to the introduction of irresponsible Jitney 'bus service, and it has even been alleged that drivers have practically run down pedestrians who were attempting to pass from the curb to the street cars.

The 'buses interfere a great deal with traffic, as they are driving in and out, cutting across the regular lines of vehicles to the curb for fares and otherwise operating erratically.

Not Practical as at Present Operated

The movement is yet so new that it is difficult to form any broad or comprehensive view. But observation shows that the



Seating Plan of Large "Jitney"

The body accommodates thirty-two passengers, and is of the pay-as-you-enter type

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

Jitneys are being shamefully abused and very much overloaded, the drivers desiring to get as many fares as possible. This of course means a disastrous finish for those who insist on heavily overloading their vehicle. Just now in the present chaotic state of the jitney 'bus business, those who are operating without paying a license fee, who have not yet ruined their vehicles, or who have not figured in any of the numerous accidents which have been caused by their introduction, think they are making money.

The actual cash taken in during the day seems large to a man who has not operated automobiles and been responsible for their upkeep. This has led many private owners into the business, and the public is, of course, glad to ride in an automobile for 5 cents, this being a novel experience, and an opportunity never before presented.

To those familiar with cost of operation figures, however, it is but a few minutes work to prove that there is no fortune in operating any ordinary touring car, with a capacity of five or six as a Jitney 'bus. A 5-cent fare is not sufficient to cover operating expenses and show a profit. It is said that the minimum taken in by any of these cars is approximately \$1 an hour, which in an eight-hour service means \$8 a day, while \$15 a day is about the maximum. With a run of from 3 to 5 miles each way, from four to six single trips can be made each hour. At the rate of 15 m.p.h., it would take at least 12 minutes for each trip of 3 miles, or perhaps more if many intermediate stops were made. Figuring five single trips an hour with full loads all the time and no lost time, twenty-five passengers, representing \$1.25, would be carried. The car would cover about 15 miles. During non-rush periods this much could not be counted upon. The distance would, however, be about the same. In 8 hours the car would run under favorable circumstances, about 120 miles and take in say \$10. Now, it is well known the cost per mile for operating a pneumatic tired vehicle, even of light weight, is at least 5 cents a mile, and from that on up as the vehicle increases in size and weight, and this does not take into consideration accidents or license fees that will eventually have to be paid for such 'bus service. From 6 to 8 cents a mile can therefore be figured as a low cost of operation, barring accidents. If 120 miles are covered, the cost is say \$7.50 to \$9.50 a day when all items as depreciation, insurances, etc., are figured in, as they must be for permanent business. It will be seen there is very little if any profit.

That there is a positive demand on the part of the public for rapid individual 'bus transportation is clearly shown, and this will doubtless bring about a systematic effort for organized 'bus lines at a moderate figure, perhaps a 10-cent fare. The Jitney 'bus business will probably result in the establishment of many 'bus lines with suitable vehicles, and regulations in the different parts of the country where there never has been a motor 'bus service before. It is believed, therefore, that when those who are now deluding themselves with the belief that they are making money are down and out, 'bus lines on a firmer and more legitimate footing will take their places, and that the Jitney 'bus will thereby serve as the forerunner of better, and very economical transportation lines.

JITNEY 'BUSES IN KANSAS CITY CREATE LOTS OF BUSINESS FOR TOP MAKERS AND BODY BUILDERS

By W. D. MENG



THE introduction of a "jitney" auto transportation service in Kansas City has resulted in a large amount of business for the manufacturers of auto tops, who are called upon to adapt motors and trucks of all descriptions to use in carrying passengers. Trucks, roadsters, vans and touring cars are being converted into "jitney" buses. One man has opened a factory in which he is building 'bus bodies especially designed for the service.

Among the first cars to be put on the streets was a five-ton Pierce-Arrow gasoline truck. It belongs to the Lincoln Fireproof Storage Company, being enclosed and used as a moving van formerly. It is a 1913 model, with 17-ft. body and is the largest car in the jitney service, having a capacity of thirty-four passengers, the chauffeur and an assistant. The attendant rides at the rear, and collects the fares and signals the driver by means of an electric button.

Seats were built along the sides of the 17-ft. space. Wooden benches were used, and were upholstered with cushions made by folding furniture pads lengthwise to four thicknesses. Three steps are provided. These were built on the endgate, which was suspended behind the car at an angle of 45 degrees with the ground. The endgate is 3 ft. high and reaches within a convenient distance from the ground when suspended thus. Inch lumber was used in constructing the steps.

A jitney was built from a 1913 model C14 Buick truck. The truck chassis and body were retained. An oak framework was constructed and over this black canvas was stretched. Its dimensions inside are 7 ft. long by 6 ft. wide by 6 ft. high. Seats were built along the sides and upholstered with spring cushions. Ten persons may ride inside and two with the chauffeur. The endgate was removed and two steps constructed on an iron bracket.

Abe Baier, the owner of a Ford roadster, who went into the jitney business, applied to one of the carriage companies for a bid on a 'bus body for his car. The next day he sent his car to their factory, and at a cost of \$75 had built on it a body with a capacity of twelve passengers. Ash sills, 4 in. square, were fastened to the chassis, and on these the floor was laid. Corner posts of the same material were erected, and between these and in the roof, strips of oak were extended on ash supports. The framework was covered with imitation leather. Roll curtains with celluloid windows were placed on the sides. A door was made by using a light wood panel in the lower half and curtain above. It is 34 in. wide, the distance between the seats. The seats are built along the side, and upholstered with hair cushions and backs.

The Hesse Carriage Company constructed the body, and since has obtained the contracts for several similar jobs. One of these is an Oakland seven-passenger car,

which will be used in a suburban town a few miles from Kansas City. It is being built with a door which opens at the right of the chauffeur, instead of at the rear, and is styled a "Pay-as-you-enter" machine.

S. S. Keyes has gone into the business of making 'bus bodies. He is manufacturing steel constructed bodies. He has published complete specifications regarding them, and at present an interurban 'bus line is contemplating the purchase of ten of these bodies. The most distinctive feature about the appearance of the cars so equipped is in the arrangement of the entrance. It is placed at the front of the machine, beside the chauffeur, who is able to collect fares without moving from his seat.

The bodies are designed for use on the chassis of any touring car or roadster, and unless otherwise desired have a length inside of 9 ft. and a width of 5 ft. They are meant to carry twelve passengers, or about 2400 lbs. The sides and back are made of 2-gage steel over an oak and steel frame. This is enameled black on the exterior, or is painted and varnished as desired. The interior is of oak, birch-mahogany, or enamel finish. The seats are built on steel posts. Upholstered box seats and spring cushions, with cushion backs, are provided. Seven-eighths inch pine flooring is used. The roof is of the same size ceiling material, covered with canvas and waterproofed. The windows are made with up-and-down sliding sashes, double strength "AA" rubber stripped. The door is built to slide also. It has a window in the upper half. There are three windows on each side, one in the rear and another behind the chauffeur's seat. The windows are fitted with spring roller cloth curtains. Brass cross bars are placed over the windows outside. Electric lights and electric signal buttons are provided and connected with a set of batteries carried under the seats.

Mr. Keyes is working on other improvements which he will include in the specifications when perfected. One of these is a device to be mounted in front to indicate how many more passengers can be accommodated. It will automatically indicate when the 'bus is filled to its capacity of twelve persons. Another device is a blue light, which will be used on the rear of the car to indicate to drivers behind when the 'bus is about to stop. The blue light will be turned on automatically when the car slows to a speed of 5 m.p.h. or less. A red bull's eye lamp is placed at the top over the rear window to indicate that the machine is a passenger carrying car. A green light is placed in a similar position in front for the same purpose. Mr. Keyes is installing top ventilators in all bodies.

About 150 jitney cars are in use. Zero weather has not interfered with their operation, although the service was instituted almost at the same time that Kansas City was caught by the coldest weather of the winter.

The trips average about 3 miles, and require 15, 20 or 30 minutes usually for the round trip. The owners of touring cars estimate that their average profits are \$6.50.

The CCJ has most readers because it gives most information

AMBULANCE-DESIGNING COMPETITION—FIVE THOUSAND DOLLARS, FIRST PRIZE

By OUR FOREIGN CORRESPONDENT



IT IS not very generally realized that some big prizes, that have been offered for an ambulance design competition in England, are open to American citizens equally with those of the United Kingdom, and indeed of all countries. In all, a sum of \$10,000 has been provided by Henry S. Wellcome, of the bureau of scientific research that bears his name, for the best designs of a field motor ambulance body. Of this the first, second and third prizes are to consist of \$5000, \$2500 and \$1500 respectively, the remaining \$1000 to be awarded in smaller sums for meritorious details.

To control the distribution of these prizes a body termed the Ambulance Construction Commission has been appointed on behalf of the donor. This commission is composed of various eminent men in the medical profession, both army and civilian, representatives of the ambulance societies, and one or two others, one of whom is a body builder.

The following are the conditions:

(A) Relating to construction.

(1) The body must carry, in comfort and safety, four wounded lying on stretchers of British Army Regulation Pattern,* or eight wounded sitting, or two lying and four sitting, in addition to the driver and orderly attendant.

(2) The patients must be sheltered from weather and sun, with due regard to ventilation. The driver and orderly must be provided with adequate shelter.

(3) The vehicle must be capable of being loaded from the ground level by four or fewer bearers.

(4) Every patient must be accessible for attendance from one side without being shifted from his position.

(5) There must be a vertical space of not less than two feet between the lower and upper tiers of patients.

(6) There must be sufficient windows to insure ample light by day, and means of lighting the interior by night.

(7) There must be means for the orderly, on the box or elsewhere, to see every patient during running.

(8) There must be means of carrying the arms and equipment of the patients,

some dressings, water, and small quantities of hot liquid in the vehicle.

(9) A vertical line through the center of gravity of the body must fall between the axles, whether the body is laden or empty. The center of gravity of the body must be kept as low as possible.

(10) The body must be kept as light as possible, compatible with adequate strength.

(11) The materials of construction should be as non-inflammable as practicable. Competitors may be called upon to submit samples of material of construction.

(12) The body must be of such a design that it shall fit a chassis, the essential dimensions of which are shown in the accompanying drawing.

(13) In making the award, the cost of construction of the body will be taken into consideration.

(B) Any number of different designs may be submitted by any one competitor.

(C) Designs may be submitted on any date up to and including June 30, 1915. No designs received after this date will be considered.

(D) All designs will become the property of the Commission.

* Dimensions: Canvas, 6 ft.; poles, 7 ft. 9 in.; width, 1 ft. 11 in.; height, 6 in.; weight, 30 lbs.

Just as I write this, comes news from the secretary that as a result of his going out to the front to study conditions and requirements, the following hints to competitors have been drawn up for their guidance:

(1) Any mechanism or device introduced into the body must be (a) easy to work, (b) simple in construction, (c) so made that it will not get out of order, rust or jam.

In this connection it should be noted that the best type of British Army stretcher slides on runners, not on wheels. Where grooves are used for taking these runners, what is called "stretcher-spreading," or "stretcher-splaying," may lead to trouble, owing to the stretcher-runner getting jammed in the groove.

(2) Lateral oscillation, especially for the upper tiers of stretchers, must be avoided.

(3) The protection and comfort of the driver (and orderly) are points requiring very careful attention. Apparently satisfactory devices for the protection of the driver were found to act as wind shafts which drove the air over his head, along

under the overhead awning and down the back of his neck.

(4) The comfort of sitting patients is essential.

In some types of ambulance-body the seats are too low, or there is not enough room for the legs to be stretched, or the seat is too broad, or the structure of the body at the back of the patient is such as to cause acute discomfort, or there is insufficient support for the back.

(5) Any satisfactory, inexpensive method of heating the interior of the body will be taken into consideration when the final awards are made.

(6) Once the stretchers are in position in the ambulance they must be kept rigid. If straps are used for this purpose, rivets in the straps must on no account be employed, owing to their liability to perish.

(7) No ambulance-body can be considered satisfactory which is not readily convertible for carrying stretcher cases or sitting cases.

(8) The relation of the carrying capacity of a body to the strength of the chassis which bears it is of the greatest importance. Overweighting damages the chassis, and consequently the whole ambulance becomes useless. In practice it has been found that unauthorized persons will ride on any part of the outside of an ambulance on which they can get a footing. The body should, therefore, be so designed as to render impossible such overweighting by unauthorized persons. Intimately associated with this is the matter of overhang. (See also the next suggestion.)

(9) The back step should run the whole breadth of the body, and it should be possible to fold it away so that it cannot be used as a footing or seat by any unauthorized person.

(10) The material used for the covering of the body should be (1) light, (2) waterproof, (3) strong, (4) easy to replace, (5) easy to wash, clean and dry quickly.

Some materials used have been found to become soaked and to dry slowly. Others ceased to be waterproof where the red cross was painted.

(11) Access to the patient means access to any part of the patient, not merely to his head or feet.

On a forty-mile convoy journey it may be necessary to dress again the wounds of stretcher cases, or a wounded man may have to be held down.

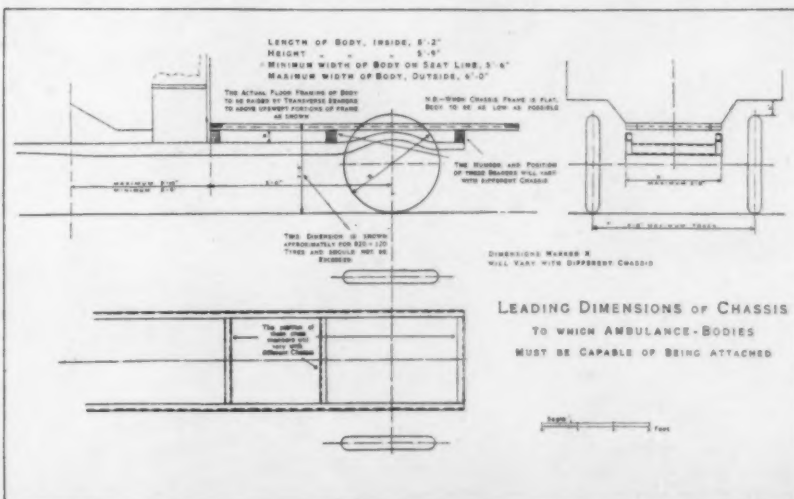
(12) Ventilation, especially in warm weather, is essential. Equally important is the avoidance of dust and draughts.

(13) The question of some mechanical device, whereby stretcher-bases, especially those for upper stretchers, can be loaded outside the "body" at a convenient level and pushed back or levered into position, seems worthy of consideration.

(14) Provision must be made for the protection of tail-lamps.

(15) It is possible that a scheme might be devised whereby the position of a locker in the interior of the body, without interfering with the arrangements for stretcher cases, would occupy space in such a manner as to prevent overcrowding by sitting patients (see No. 7).

(16) It must not be forgotten that emergency stores of carbide and petrol, together with 2 days' rations for personnel (i. e., driver and orderly), must be carried. It has been found necessary in practice to carry special supplies of water for the wounded in each ambulance.



(17) Good ideas for shaded headlights, and improvements in motor horns are worthy of consideration.

The object of the competition is to produce, if possible, a standard ambulance body of perfect design to fit standard chassis. Apart from the prizes, no payment will be made for the design, which will then be available for the cause of humanity, and arrangements will be made for testing at once any idea upon which the commission may report favorably. It is, further, Mr. Wellcome's intention to publish eventually, in illustrated form, such material and information as the commission may consider as worthy of being preserved as a permanent record.

THE PROBLEM OF THE ECONOMICAL TRAILER

By LEN G. SHAW

"Selling a man a motor truck isn't the task it once was, because their use is so common, and their advantages so generally known that the up-to-date merchant or manufacturer or contractor recognizes their worth, even though he may hold back about adopting them. It is often easy, by the same token, to interest a prospect in a trailer, because it is a case of hauling two loads where one was formerly possible. But suggest to a man that he should own three trailers, and he immediately sets you down as well on the way toward a padded cell."

The speaker was a man who has made his mark selling trucks with one of the biggest companies in the United States.

"On the face of it such an assertion does seem a bit foolish. It is usually counted enough for the owner of a motor truck to invest a thousand or twelve hundred dollars or whatever amount is required for a trailer to use in connection with that truck. The thought of tripling this investment without any increase in motive power might well give rise to suspicion regarding the sanity of the propounder—until you analyze the situation.

"As a matter of fact, there are many places where one trailer is a good thing, two would be a bad investment, and three will pay fat dividends. That seems a bit far fetched, but here is how it works out:

"The secret of profitable truck operation consists largely in keeping that truck moving a maximum amount. The more ground you can cover in a given time with a load the more economical becomes the expense of delivery. Just so every minute lost unnecessarily raises the cost of this form of transportation, because there is a heavy investment lying idle, as well as a driver whose pay goes on, and all the other little items that must be taken into account.

An Example

"Let us take for illustration a brick manufacturer, that being about as hard a commodity as any to handle. The plant is at the outskirts of the city, say 6 miles from where a considerable quantity of brick are

to be laid down. The maker uses a five-ton truck and a trailer of like capacity. The truck is speeded at 12 m.p.h. This means that every round trip occupies 60 to 70 minutes on the road. It takes a half hour to load the truck, we will say, and the same time to unload it at the other end of the line. Say $2\frac{1}{4}$ hours to haul 5 tons 6 miles and get back to the starting point.

"With a trailer 10 tons would be hauled at each load; but it would take 1 hour longer on each trip, because of the time required in loading and unloading the trailer. This would mean that whereas it would be possible to make five round trips in 10 hours with a truck alone, hauling 25 tons, only three trips could be made in the same time with a trailer, hauling 30 tons, or a gain of 5 tons in favor of the trailer.

Advantage of Three Trailers

"Now, let us start the day with three trailers under favorable conditions. One of these is at the receiving station, where it was left the night before to be unloaded. The second is at the yard, filled. The third is also at the yard, empty, just as it was returned on the last run of yesterday.

"The truck starts out with its own load, and 5 tons on the trailer. Arrived at the receiving point it is unloaded, the full trailer uncoupled, the empty hooked on, and it hastens back to the yard, where the operation is reversed, a full trailer being in waiting. It only takes a minute or so to couple on to the full trailer after the truck is loaded, and get under way, so that there is no appreciable loss of time in the operation. Keeping this up all day means that the truck and trailers will make five trips,

hauling 10 tons each, or a total for the day of 50 tons, as against 25 tons for the truck alone, and 30 tons with truck and one trailer.

"The difficulty with a two-trailer arrangement is that for a considerable portion of the time your truck is standing idle while one or the other of the trailers is being loaded or unloaded, as the case may be.

"It should not be inferred that with a trailer it is possible to haul twice as much at the same cost, because that is not true. Of course, a single driver is sufficient for both truck and trailer, so the matter of wages is cut in two.

"But there are other factors to be taken into account. Anybody knows that the strain of hauling 10 tons is greater than the pulling power exerted with half that amount, hence the increased strain on the engine and transmission. Then there is the matter of tires, particularly the back ones on the truck, which are subjected to increased friction and consequent wear.

"Just what the depreciation on these two items amounts to nobody can tell. Engineers have not, so far as I know, figured out the problem. Tire men are now experimenting along this line, and it is probable that in due season the added depreciation will be reduced to figures anyone can understand."

Auto Express Company, 217 State St., New Haven, Conn., formed by Walter H. Galaske to operate between New Haven, Milford and Bridgeport. A general express business will be carried on between these points.



Complete Circus and Moving-Picture Show, Being Carried Across the Country on a Motor Truck

The truck and show is the property of A. L. Brown, who is making exhibitions in the different towns of the United States. Brown is accompanied by his wife and a helper. The outfit has been on the road about six weeks, starting from Lansing, Michigan, and has shown in nearly all the towns through which it has passed. A leopard, two monkeys, a picture machine, five reels of film, clothes, cooking utensils and a lighting outfit, are carried on the truck, which is a one-ton Republic. It is Brown's intention to reach San Francisco in time for the opening of the exposition.

The road to success is easy,---use commercial cars

The CCJ leads in circulation, advertising and prestige



INFORMATION BUREAU AND CORRESPONDENCE



VIEWS OF A DRIVER

TO THE EDITOR:

For some time I have been following your editorials on the subject of commercial car drivers and most heartily agree with you that the majority of truck drivers are absolutely incapable of handling trucks and feel safe in saying that taking them in units of ten, five are absolutely poor, two are fair, two are good and one excellent.

Not only are the men to blame, but also the owners of trucks who expect to get operators for their trucks at a price that is absolutely out of the question for a good man. Then again they expect them to work hours that are too long. During the past summer I worked at a place where the men were expected to pull out of the garage at 6 A. M., to haul coal all day and some of them handle it and stay at it until 6 P. M., and even then when they came back to the yard at 5.30 be given another trip which would throw them an hour late getting in for which they got no over time. For this they received \$2 per day on one-ton trucks, \$2.25 on two-ton trucks and \$2.50 on four-ton trucks and very seldom a week went by but what their wages were cut for some trivial reason. This is an example of conditions not only of one place but many around the country so what else can be expected? It's a case of "penny wise and pounds foolish" which was particularly demonstrated in this case because this company's upkeep expenses were simply tremendous.

On approaching an owner of several trucks the other day on the matter he said, "I send out a man with a C. O. D. order amounting to \$5 and am worried half sick for fear he won't come back, yet I turn him loose with a \$3000 truck and let him smash it up."

On questioning some few men who operate trucks I found but one who knew the real technical and practical reason why the spark has to be advanced and retarded, and on the subject of proper gear shifting none. Some of them by chance would shift gears without clashing them, but none knew that it was a matter of the gears travelling at the same peripheral speed. Although the majority of them knew there was a clutch brake on the car they did not know how to use it. The results of such uncapableness can be seen only too often in the service departments. As every gear goes into mesh its Crash!—Bang—yet the owners won't pay competent men and the reputation of the various trucks have to take the blame.

During the latter part of the summer I was operating a truck on a contract haul of seven miles one way and on the out trip had to climb one of the worst hills out of Washington, a hill that will test out the best truck ever built. Now this particular hill had a snake curve of a pretty stiff grade which led to the hill proper, which around this vicinity is regarded as "Some Hill."

On this haul were some trucks recognized as the best on the market as well as some of lesser merits, which to pay had to

cover the route five to six times per day; but this hill proved their undoing, as well as proved to me that the best trucks built have got to be built different to be a success. The trouble was mostly due to small motors having to be run at too high a speed to get enough power out of them and none of them made the hill at governor speed with any great success. The one I operated had one of the best known 45 h.p. engines in it, but on high gear had to run 1100 r.p.m. to pull the car 12 m.p.h. on the level so to make the hill on low you can realize that 1400 to 1500 r.p.m. was what it had to do to get over the hill. The two recognized leaders had all kinds of trouble as well, they simply did not have enough motor in them and consequently they had to shift on all grades which with most drivers means wear and tear on the transmission and costly upkeep. Another thing: when any of the trucks got stuck on the hill it was a proposition to hold them on account of inadequate brakes and as far as that is concerned I have my first truck to see yet that has adequate brakes easily adjusted. Many makers claim "Oh ours are fine," but on the acid test they are not there, and on one outfit which I have had experience with the brakes although good with all their controls and rods look like a mystic maze and when a car is in motion rattle like sin.

The main thing that has been on my mind is instead of using a 4 cylinder motor of small h.p. and having to run it from 900 to 1400 r.p.m. on the four and five-ton trucks to get about 12 miles per hour. Why not use a six with bore and stroke the same and cut down the speed 200 to 300 r.p.m. I know some people in fact, a great majority, will say, Oh my! impossible, why, drivers have enough trouble as it is with four cylinders, but I claim the average driver will know as much about a six as he will about a four.

To get right down to the point, the gasoline consumption would be practically the same on account of the decreased speed of the six, and the grades that could easily be taken on high with a six, which would have to be taken on the next lower with a four, would help save on the gas also.

I'll admit of a small increase in oil consumption, but what is this compared with the results obtained by having a motor that can develop a constant (or practically constant) torque at low speed, a motor that is flexible and can pick up the load without dropping back into a lower gear, a motor in which the vibration is one-third to one-half as great as in a four, and one in which each cylinder and piston does not get near as much strain as it does on the four with a resulting saving in wear and naturally upkeep.

In closing I want to cite an example I know of, a certain four-ton truck that has a 45 h.p. motor which has to run at 1100 r.p.m. to drive the car 12 m.p.h. on the level and very slight grades, which means a lot of vibration and heating up, now if this same car had a six of the same bore and stroke, or a little smaller, it could be run between 250 to 350 r.p.m. less. Take

for granted 250. Now the four running at 1100 r.p.m. would make 66,000 per hour and in 5 hours of actual running time would make 330,000 revolutions.

Now a six in the same car running 250 r.p.m. less than the four would be running at 850 r.p.m., which would be 51,000 per hour and in 5 hours of actual running 255,000 revolutions, which is 105,000 revolutions less than the four in a days running. I claim that the reduced speed of the six would entirely make up the difference in gas consumption.

From a practical standpoint in actual service, I have come to the conclusion that a six with its decreased r.p.m., its ability to deliver constant torque, the decreased vibration, and the saving in not having to shift gears so often make it a much more desirable motor for a heavy truck than a four.

Another thing that has been demonstrated to me in actual country road work is that chain drive on trucks has got to be relegated to the past and be displaced by a shaft drive because mud and grit play havoc with the chains and sprockets and make a very costly means of drive.

On the particular road work of which I speak one of the trucks had a four-speed transmission with direct drive on third, and all a person would have to do is try to work beside that car, for two months with a car with a three-speed transmission to be fully convinced that the four-speed transmission with direct drive on third should be a feature on all heavy duty trucks.

Lastly, with as much cry as there is about accessibility, I sincerely believe that most automobile men will agree with me that most motors are just as inaccessible as they were 3 years ago and the only redeemable feature is that they don't have to be gotten to as often.

G. S. MERION.

Washington, D. C.

GETTING THE REAR AXLE PARALLEL

TO THE EDITOR:

How can I be sure that the rear axle is at right angles to the center line of the truck on a chain drive model? In other words, how can you tell when one radius rod is lengthened too much?

Ogdensburg, N. Y.

AXLE.

You will find that the jack shaft is mounted, or revolves in trunnions fastened to the frame. The jack shaft is therefore fixed at right angles to the center line of the truck. It is only necessary therefore to measure the distance on each side from the jack shaft to the rear axle. This can probably best be done by cutting a stick the right length for one side and then trying it on the other side. It is not always possible to keep both radius rods equal on account of inequality in the length of chains owing to wear, but the difference should not be great. Taking out or putting in another link in the chain may help.—EDITOR.

WHAT DOES IT COST PER TON BY TRAILERS?

To the Editor:

There is a proposition to establish an auto truck line for a distance of 100 miles. This line will be built through a country that is comparatively level, there will be no grades of any consequence—in fact, all conditions are to be made perfect for trucking and automobiles.

Could you give me the cost, under favorable condition, of handling a ton of freight per mile with auto truck, using trailers.

I am one of those that believe that in time new countries will be opened up with auto trucks instead of short lines of railroads for the purpose, and this will come more rapidly when the cost of handling a ton of freight is nearer on parity with that of transporting by steam railroads.

Midland, Texas.

R. D. YOAKUM.

The cost of handling goods by auto varies, of course, with many factors, such as the size of the truck and type of trailer, length of the haul, kind of roads, cost of help, fuel, etc.

The reason that it is possible to haul goods by truck and compete with railroads is that by truck several handlings are eliminated, and in distances up to 100 miles, time is actually saved over the railroad, because the truck takes the goods with one loading and unloading from the point of shipment to the point of destination.

Figures on this subject are very scarce. In the February, 1912, issue of "The Commercial Car Journal," we had a table of operating expense of trucks, which showed a cost per ton mile on different sized trucks as follows:

1 ton operating 100 miles, per day, .0923
1 " " 50 " " " .1437
2 " " 100 " " " .064
2 " " 50 " " " .0928
3 " " 100 " " " .0514
3 " " 50 " " " .0735
5 " " 100 " " " .042
5 " " 50 " " " .0571

There are even less figures on hauling by trailers. In the April, 1913, number we had some results of tests made by the Troy Wagon Works, these results

being in the form of curves. These showed that on hauls of from 4 miles up a tractor with three trailers, one in transit, and the other two loading and unloading, had a cost per ton mile of from 5 to 6 cents, the cost of the four-mile haul being greater than that of the ten. The cost of doing the same work by a single truck varied between 15 and 20 cents per ton mile, and with a single horse team it ran from 23 to 26 cents. In short hauls much depends upon the speed with which you can load, but in hauls as long as yours, this is not so much of a factor. Careful driving is more important.—Editor.

HOW TO GET BEST RESULTS FROM DRIVERS

To the Editor:

We operate a number of motor trucks, hauling coal, and are anxious to work out a scheme to induce the drivers to produce more business without abusing our trucks. Our hauls vary from 1½ to 8 miles, round-trip, so we can't offer a reward for the greatest number of tons delivered, as it would be unfair to the other trucks that might have longer hauls. We were wondering if a ton-mile proposition would be a fair one? Of course, the trucks operating on the shorter hauls would have to load more frequently, and this would work against them.

We want to offer a suitable reward at the end of the year to the man who delivers the most tonnage, ton-miles, or whatever is fair, and at the same time has his truck in the best condition, or in good condition.

BAY STATE TRANSPORTATION COMPANY.

Fall River, Mass.

You are correct in your supposition that neither ton mileage nor total tons delivered will be fair, one favoring the short haul men and the other the long haul. Would suggest some system as follows: It will be impossible for you to be fair to your drivers unless you know without any doubt just what they are doing on the road, and there is but one way to know, namely, equip your vehicles with recording instruments which will show the speeds, mileage, stops, length of stops, etc. With this

information you have an absolute tab on your men and what they are doing. You can then base your prizes on the following: the driver that most nearly conforms with your regulations in regard to speed and handling on the road; the driver whose average time of unloading throughout the year is the shortest; the driver who has wasted the least time on the road (this cuts out the corner saloon habit); best condition of truck, as far as the driver is responsible for this, as told by inspection at times unknown to the drivers.

This is the only way that we can suggest which will be fair to all drivers. As a further suggestion, will say that it will pay you, we think, to protect your drivers from the weather by a cab, windshield, or other means which will comfortably house them during the winter. This alone will prevent much wasted time warming up in saloons and other resorts. Suitable plates about 2½ ft. long by 1 ft. wide, fitted with riveted on cross cleats, top and bottom, which can be slipped under the wheels when stuck in the snow or on ice, and which can be carried anywhere on the truck, will be found very effective in saving time in winter weather.—Ed.

KEEP OUTSIDE OF CRANK CASE CLEAN

Several times we have had trouble with our oiling system on our — truck. The oil is pumped over and used again. In some unknown way the line becomes clogged with dirt. Every bit of oil we use is strained. The question is how does this dirt get in?

Could it be accumulations from worn bearings or rubbing surfaces?

St. Louis.

MYSTIFIED.

If any of the wearing surfaces were cutting sufficiently for the particles to clog the oiling system, the dirt would be gritty and show unmistakably that it was metal particles.

It is much more likely that a careless operator in removing a hand hole cover has allowed caked dirt in the corners or around its edges to drop into the crank case. If this happened a few times it would easily account for sufficient dirt to cause the clogging.—Editor.



Case for the Society for the Prevention of Cruelty to Trucks

The photographer's snap here shows us why trucks in the hands of some users don't make good. Just look at the springs, bent downward under the excess of lead pipe, etc.; look at the few extras on the tailboard, fully a ton of overhanging bath tubs and other featherweights. It's lucky there wasn't anything else to go, for it surely would have been put on the roof. The fellow that perpetrated this "dirty work" is to be congratulated that he was loading a truck and not a mule.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

On the other side of this leaf will be found the key to the abbreviations used in the

***Buyers' Information
Commercial
Car Review***

While consulting the Review, turn this leaf out so that it extends beyond the book, it will then be convenient for reference, no matter how many pages you turn to.

Indexes arranged alphabetically and according to price are on pages 36b, 36c and 36d.

KEY OF ABBREVIATIONS

USED IN THE

Buyers' Information Commercial Car Review

Chassis Weight: Given in pounds and includes weight of chassis only; * complete.

Price: In the table the prices are for chassis only, unless marked with an asterisk (*), in which case they include both chassis and body. In the captions, the prices are for the car complete with body as shown in the illustration, unless otherwise stated.

Bodies: Gives the styles of bodies carried as standard stock. Bodies other than those indicated can usually be had on order. Prices of these bodies, where obtainable, are given in the captions under the illustrations. P, panel; S, stake; F, Flareboard; C, canopy top; E, express; SS, screen side; D, power dump; H, hand dump; B, box body; T, tank.

Wheelbase: In inches—O, optional.

Load Platform Height: In inches.

Maximum Speed: In miles per hour—O, optional.

Horse Power: Calculated by the S. A. E. formula, 4-cycle $H. P. = \frac{D^2 N}{2.5}$; 2-cycle $H. P. = \frac{D^2 N}{1.515}$;

D = bore in inches, N = number of cylinders. Motors are 4-cycle unless horse power is preceded by an asterisk (*), which indicates 2-cycle.

Cylinders Cast: S, singly; P, pairs; B, en bloc.

Cooling: T, thermo-syphon; G, gear pump; C, centrifugal pump; A, air; W, water.

Radiator: H, honeycomb; T, tubular; C, cellular; V, vertical.

Carburetor: B, Breeze; BE, Bennett; C, Carter; E, Excelsior; F, Flechter; FR, French; H, Holley; K, Kingston; M, Marvel; MA, Master; MU, Muir; MY, Mayer; O, optional; R, Rayfield; SB, Stromberg; SL, Schebler; SP, special; SU, S. U.; U, Universal; Z, Zenith; ZP, Zephyr.

Lubrication: S, splash; F, force-feed; G, gravity; M, mixed with fuel.

Ignition: A, Atwater Kent; B, Bosch; BL, Berling; BR, Briggs; C, Connecticut; D, Delco; E, Eisemann; H, Heinze; M, Mea; N, National; S, Simms; SD, Splitdorf; U, U. & H.; W, Western Electric; WS, Westinghouse; WY, Wyco.

Spark Plug Size: S, S.A.E.; $\frac{1}{4}$, $\frac{1}{2}$ in. pipe; M, Metric.

Clutch: B, band; C, cone; D, disc; S, special.

Drive: B, bevel gear; C, chain; W, worm; I, internal gear; V, belt; R, roller; S, shaft; SP, spur; O, optional.

Transmission: S, selective; P, progressive; L, planetary; F, friction; H, hydraulic; E, electric.

Tires: Solid unless otherwise indicated—*, pneumatic; D, dual; †, cushion; S, steel; O, optional; W, Wood.

Steering Wheel: R, right; L, left; C, center; O, optional.

Control Levers: R, right, L, left; C, center; O, optional.

Engine Starter: E, electric; O, optional; X, extra.

ADDITIONAL ABBREVIATIONS USED ON ELECTRICS

Motor: S, series; SH, shunt.

Battery: E, Edison; EX, Exide; GV, G. V.; P, Philadelphia; U, U. S. L.; S, Special.

Controller: D, drum; K, knife blade.

Drive: H, Herringbone.

Rear Axle: F, floating; D, dead.

Indexes arranged alphabetically and according to price, are on pages 36b, 36c and 36d.

LAST HALF OF REVIEW. FIRST HALF WAS IN JANUARY ISSUE

Western Half of Buyers' Information Commercial Car Review

Eastern Half was in January Issue

On the following pages is given a complete review of the Commercial Car Models which will be manufactured for the coming season by Western American Manufacturers.

See Complete Indexes on Pages 36b, 36c and 36d

THIS is the second or Western Section of the Review, and includes cars manufactured in the following States: California, Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Oregon, Texas, Washington and Wisconsin.

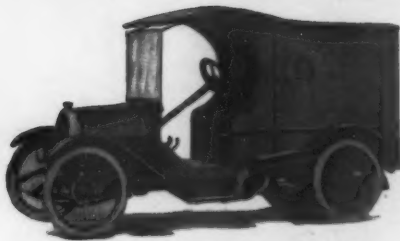
The first or Eastern Section was issued January 15th, and contained a review of cars made in the following States: Connecticut, Kentucky, Maryland, Massachusetts, New York, New Jersey, North Carolina, Ohio and Pennsylvania.

The data given in this Review was supplied direct by the makers, and is as correct as can be obtained. Any omissions or inaccuracies which occur are due to imperfect information given us by makers.

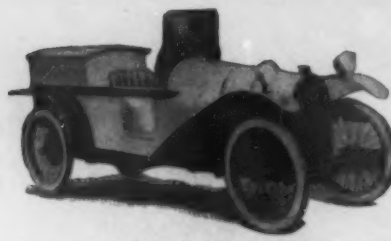
Key to Abbreviations will be found on the leaf attached to this page; when this is opened out it will be found very convenient to refer to, no matter which pages of the Review are consulted. Indexes will be found on pages 36b, 36c and 36d.

Criticisms and Suggestions on this Buyers' Information Review are invited. We want to know whether it meets requirements and how it can be made better, if possible.

Horse-Power Formula.---All horse powers are calculated by the S. A. E. formula: $H. P. = \frac{D^2 N}{2.5}$; 2-cycle engines by the modified formula, $H. P. = \frac{D^2 N}{1.315}$ where D=bore in inches and N=number of cylinders.



Brase 500-lb. Panel, \$450.
Also Stake, \$450; Flareboard, \$450.



Vixen Model P-D, 500-lb. Parcel Van, \$385.
Made by Davis Mfg. Co.

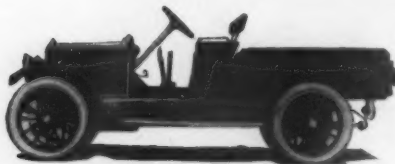


Woods Mobillette Model 4-A, Flareboard, \$380.
Made by International Cyclecar & Accessories Co.

500 Pound Gasoline Commercial Cars



Harley-Davidson 600-lb. Box Body Tricar, \$375.



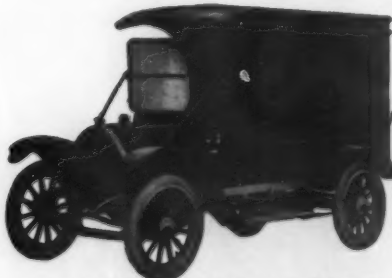
Overland Model S1, 600-lb. Flareboard, \$650.
Made by Willys-Overland Co.



Bauer Model A, 1000-lb. Flareboard, \$1050.
Also Model B, Canopy Top, \$1100; Model C, Panel, \$1150.



Mercury Model F, 1000-lb. Panel, \$670.
Also Panel with Glass Windows, \$875.



Kosmath Model 14, 1000-lb. Panel, \$650.
Also Stake, \$940; Flareboard, \$920.

Model	Chassis Weight	Chassis Price	Styles of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled
Hdy-Wgn Jr	1100	293	P	15	11	2	3.75	3.75	S	A		
Packet	1000*	450*	P, S, F	100	30	40	10	4	2.5	4	B	T
PD	960*	105	B	106	40	12	4	2.75	4	B	T	
.....	.....	525*	.....	105	12	4	2.75	4.25	B	T		
B-1	.....	385*	F	100	12	4	2.75	4	B	T		
.....	850	435	P	100	30	35	12	4	2.75	4	B	T
4	700	380*	P	104	24	35	10	4	2.5	4	B	T
A	.....	100	.....	55	12	4	2.75	4	B	T		
1915	.....	100	.....	12	2	4	4	S	A			
.....	1200	.....	P, S, F	96	30	14	9	1	4.68	6	S	A

600 Pound Gasoline Commercial Cars

.....	450	255	.....	102	22	25	12	4	2.75	4	B	W
.....	510*	375*	.....	76	40	9	2	3.31	3.5	S	A	
.....	500	.....	.....	104	50	13	5	2.56	3	S	A	

800 Pound Gasoline Commercial Cars

Hdy-Wgn	1400	488	.....	77	15	14	2	4.13	4	S	A	
32	.....	850	P	106	34	20	17	4	3.25	5.5	B	T
.....	1076	.....	.....	102	24	30	12	4	2.75	4	B	W

1000 Pound Gasoline Commercial Cars

A	1800	900	P, F, C	100	34	25	23	4	3.75	5	B	C
A	2000	845	P, S, F	100	30	24	21	4	3.68	4	B	T
M-W	2135	.....	E, S, C	90	36	15	16	2	4.5	5	S	C
14	1785	850	P, S, F	110	34	25	20	4	3.5	4	P	W
14	1785	850	P, S, F	120	34	25	20	4	3.5	4	P	W
P	1500	.....	P, F	85	38	15	14	2	4.25	4	S	A
.....	.....	.....	F	.....	20	4	3.5	4	.....	.....	W	
Delivery	.....	325*	P	82	8	2	3.25	3.75	S	A		
T	.....	1000	.....	115	20	4	3.5	5	B	T		
A	1400	600*	P	88	36	15	21*	2	4	4	S	.....

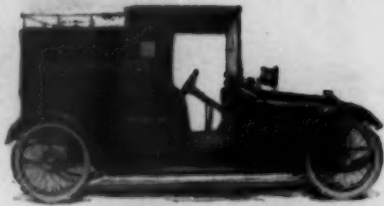


Wilcox Truck Model T, 1000-lb. Flareboard, Chassis, \$1000.



Mercury Model F, 1000-lb. Open Express, \$600.

LAST HALF OF REVIEW. FIRST HALF WAS IN JANUARY ISSUE



Woods Mobillette Model 4, Panel, \$380.
Made by International Cyclecar & Accessories Co.



Monitor, 1000-lb. Flareboard.



Wade 500-lb. Flareboard, \$300.
Also Stake, \$300; Panel, \$325.

500 Pound Gasoline Commercial Cars

Radiator	Carburetor	Lubrication	Ignition	Spark-Plug Size	Clutch	Drive	Transmission	Speeds Forward	Front Tires	Rear Tires	Steering Wheel	Brake and Gear Levers	% Total Weight on Rear Wheels	Engine Starter
..	K	S	N	1/2	D	C	L	2	28x3	28x3	R	R	75	..
C	MY	SF	BL	1/2	V	F	..	..	28x3	28x3	L	L	60	..
T	ZP	S	A	S	..	..	F	..	28x3*	28x3*	C	R	60	..
T	SL	S	BL	M	D	B	S	3	30x3*	30x3*	L	C	..	E
T	H	SF	A	1/2	D	B	S	..	28x3*	28x3*	..	C	..	..
T	MY	SF	S	S	D	B	S	2	3*	3*	L	C	55	..
C	MY	S	BL	1/2	C	B	P	2	28x2 1/4*	28x2 1/4*	L	L	..	..
T	MY	S	..	1/2	D	B	S	3	30x3*	30x3*	L	C	..	..
..	SL	F	A	S	D	S	L	2	28x3	28x3	L	L	..	..
..	SL	G	WY	1/2	D	C	IC	2	32x2	32x2	R	R	60	..



Auburn 500-lb. Handy Wagon, \$400.



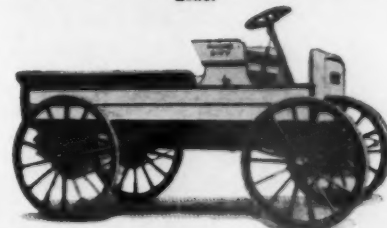
International Model MW, 1000-lb. Screen Side.

600 Pound Gasoline Commercial Cars

H	H	S	BL	S	C	B	S	2	28x3*	28x3*	..	L	..	..
..	SL	F	B	S	D	C	P	3	28x3*	28x3*	C	C	50	..
..	..	G	..	M	..	B	S	3	28x3	28x3	L	C	..	..

800 Pound Gasoline Commercial Cars

..	B	S	N	1/2	D	C	L	2	..	..	R	R	75	..
H	Z	F	B	S	D	B	S	3	33x4*	33x4*	R	C	50	E
T	ZP	S	BL	S	C	C	S	3	30x3 1/2	30x3 1/2	L	C	64	E



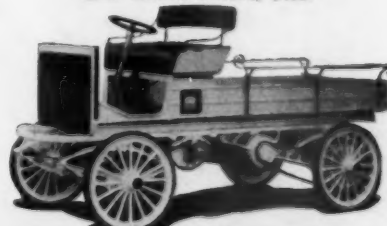
Mercury Model F, 1000-lb. Flareboard, \$750.
Also Panel, \$850; Wood Panel, \$875; Fore Door Panel, \$900.

1000 Pound Gasoline Commercial Cars

T	SL	SF	M	1/2	D	SP	S	3	36x2	36x2	L	C	80	E
H	SB	S	BR	S	C	B	S	3	32x3 1/4*	32x3 1/4*	L	C	67	..
V	SL	F	H	S	B	C	S	2	..	..	R	R	50	..
V	H	SF	E	1/2	C	B	S	3	32x3 1/4	33x4	L	C	75	..
V	H	SF	E	1/2	C	B	S	3	32x3 1/4	33x4	L	C	75	..
..	SP	SF	R	1/2	D	C	L	2	38x2	40x2	R	R	50	..
T	M	..	..	..	..	C	S	3	34x3	34x3	L	..	..	..
..	SL	SG	A	S	D	V	S	2	2 1/4*	2 1/4*	R	R	..	..
T	BE	S	M	S	D	S	S	3	..	..	L	C	..	..
H	MY	F	A	1/2	D	C	L	2	..	..	O	O	60	..



Hall 500-lb. Packet, \$435.



Homer Model A, 1000-lb. Flareboard, \$600.



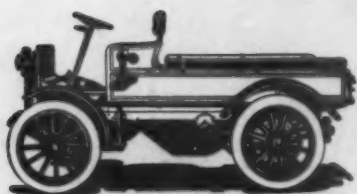
Dart Model A, 1000-lb. Flareboard, \$875.
Also Panel, \$975; Stake, \$915.



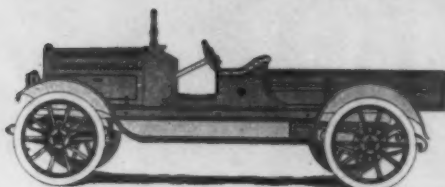
Crichet 1000-lb. Panel, \$325.
Made by Motor Products Co.

BODY DETAILS OF CARS NOT ILLUSTRATED
Auburn 500-lb. Handy Wagon, Jr., \$538.
Wade 500-lb. Flareboard, \$300.
Harley-Davidson 600-lb. Box Body Tricar, \$390.
Brasie 600-lb. Express, \$450.
Kupmobile Model 32, 800-lb. Panel, \$1050.

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Durant-Dort "Best" Model A, 1200-lb. Flareboard, \$930.
Also Panel, \$925; Canopy Top, \$890; Screen-side, \$925.
Above prices are with pneumatic tires; solid tires \$50 less.



Dispatch Model E, 1200-lb. Convertible Flareboard, \$935.



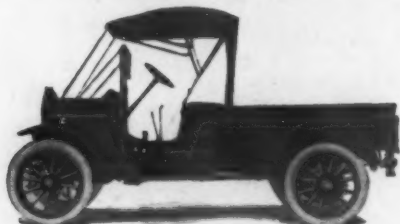
O. K. Model C, 1200-lb. Flareboard, \$925.

1200 Pound Gasoline Commercial Cars

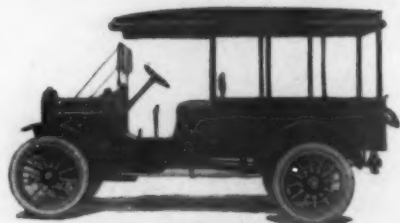
Model	Chassis Weight	Chassis Price	Styles of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled
Hdy-Wgn Sr	1800	700	P, F, E	86	15	18	2	4.75	4.75	8	A	
L	2000	850	P, F	120	28	30	20	4	3.5	5	B	T
A	1900	800	P, F, C, SS	78	29	18	16	2	4.5	4.5	S	T
C	2200	875	P, F	115	35	25	20	4	3.5	5	B	T
.....	1700	875*	E, F, F, C	100	..	19	..	..	..	..	B	W



Crown Model A, 1500-lb. Canopy Top, Chassis, \$2000.



Commerce Model S-A, 1500-lb. Flareboard, \$975.



Commerce Model S-H, 1500-lb. Canopy Top, \$975.



Commerce Model S-C, 1500-lb. Panel, \$975. Also Stake, \$975.



Dorris Model 1-A-4, 1500-lb. Florist Delivery Chassis, \$1950.



Menominee Model A-2, 1500-lb. Flareboard, \$1200.
Also Stake, \$1200; Panel, \$1225.
Made by D. F. Foyer Co.



International Model E, 1500-lb. Flareboard. Made by International Harvester Corp.



Kissel-Kar 1500-lb. Panel, Chassis, \$1500. Also Stake, \$1625.



Independent Model F, 1500-lb. Panel, Chassis, \$1525.

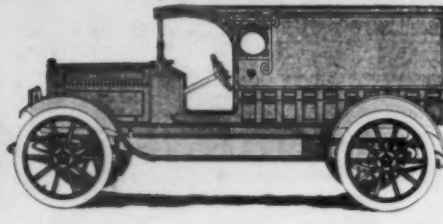
1500 Pound Gasoline Commercial Cars

V2	2650	1125	Buckeye Mfg. Co., Anderson, Ind.	114	30	15	23	4	3.75	4.5	P	C
C4	2700	1150	Buick Motor Co., Flint, Mich.	122	34	25	23	4	3.75	5	P	C
S	2000	875	Commerce Motor Car Co., Detroit, Mich.	107	..	25	20	4	3.5	5	B	W
A	2800	2000	Crown Commercial Car Co., North Milwaukee, Wis.	130	31	20	23	4	3.75	5	B	C
A	3200	1500	Denby Motor Truck Co., Detroit, Mich.	120	31	18	20	4	3.5	5	T	T
IA4	.....	1950	Dorris Motor Car Co., St. Louis, Mo.	132	..	25	31	4	4.35	5	P	C
IA4	.....	1950	.....	144	..	25	31	4	4.35	5	P	C
E	2250	750	Fargo Motor Car Co., Chicago, Ill.	100	38	26	16	2	4.5	6	S	T
15	2360	1090	General Motors Truck Co., Pontiac, Mich.	122	30	20	20	4	3.5	5	B	C
F	2650	1285	Independent Motors Co., Port Huron, Mich.	112	..	18	..	..	3.5	5	B	T
F	2650	1285	.....	128	..	18	20	4	3.5	5	B	T
.....	.....	.....	International Harvester Corp., Chicago, Ill.	102	36	..	16	2	4.5	5	S	C
.....	.....	.....	Thomas H. Jeffery Co., Kenosha, Wis.	118	32	25	23	4	3.75	5.5	B	C
.....	2800	1300	.....	118	32	25	23	4	3.75	5.5	B	C
.....	3100	1600	Kenan Mfg. Co., Long Beach, Cal.	120	30	18	23	4	3.75	5	B	T
.....	2800	1500	Kissel Motor Car Co., Hartford, Wis.	125	32	20	29	4	4.25	5.25	P	C
E1	3200	.....	Wm. E. McIntyre Co., Auburn, Ind.	120	42	12	26	4	4	4	S	G
.....	.....	1800	Moreland Motor Truck Co., Los Angeles, Cal.	126	31	20	23	4	3.75	5.25	B	C
C	1975	875	W. A. Paterson & Co., Flint, Mich.	..	28	24	20	4	3.5	5	B	T
A-3	2800	1125	D. F. Foyer Co., Menominee, Mich.	112	..	20	23	4	3.75	4.5	P	C
F	2800	995	Republic Motor Truck Co., Alma, Mich.	124	39	20	20	4	3.5	5	B	T

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O. K. Model C, 1200-lb. Panel, \$975.



Dispatch Model L, 1200-lb. Panel, \$1000.

1200 Pound Gasoline Commercial Cars

Radiator	Carburetor	Lubrication	Ignition	Spark-Plug Size	Clutch	Drive	Transmission	Speeds Forward	Front Tires	Rear Tires	Steering Wheel	Brake and Gear Levers	% Total Weight on Rear Wheels	Engine Starter
..	B	S	N	1/2										
H	R	F	B	1/2										
V	M	F	R	1/2										
T	SB	F	B	S										
H	..	..	..	..	..	..	..	..	..	..	..	..	..	..

1500 Pound Gasoline Commercial Cars

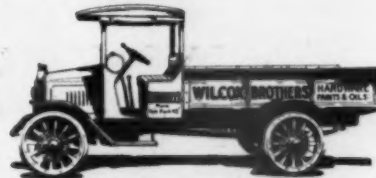
V	E	SF	B	1/2										
V	M	S	D	S										
V	H	SF	E	S										
T	SB	SF	B	M										
T	SB	SF	E	S										
H	SB	S	B	S										
H	SB	S	B	S										
C	SL	S	BR	S										
T	M	SF	E	S										
C	ZP	SF	M	S										
C	ZP	SF	M	S										
V	H	F	H	S										
V	O	SF	R	..										
C	SB	F	B	1/2										
T	SB	S	B	S										
T	SL	SF	..	1/2										
V	MS	SF	WS	S										
T	SB	S	B	S										
V	SB	SF	B	S										
..	SB	SF	B	1/2										



Buick Model C-4, 1500-lb. Flareboard, \$1225.



Republic Model F, 1500-lb. Flareboard, Chassis, \$900.

Sterling 1200-lb. Panel, \$975.
Made by Sternberg Motor Truck Co.Denby Model A, 1500-lb. Flareboard, \$1893.
Also Stake, \$1615.Fargo Model E, 1500-lb. Covered Flareboard, Chassis, \$750.
Also Panel, \$900; Flareboard, \$850; Furniture, \$850.GMC Model 15, 1500-lb. Flareboard, \$1215.
Also Canopy Top, \$1260; Screenside, \$1285.
Made by General Motors Truck Co.

Jeffery Model 1514, 1500-lb. Flareboard, \$1400.

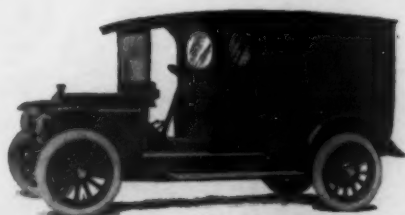
BODY DETAILS OF CARS NOT ILLUSTRATED
Auburn 1200-lb. Handy Wagon, Sr., Panel, \$925.
Also Flareboard, \$775; Express, \$750; Solid Panel, \$810.

Wisconsin Model W-E, 1500-lb. Panel, \$1800.
Also Stake, \$1725; Flareboard, \$1750.

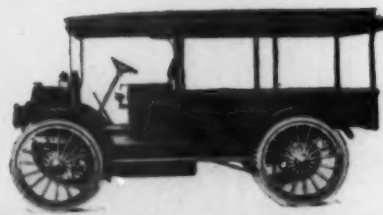
Lambert Model V2, 1500-lb. Stake, \$1200.
Also Flareboard, \$1200.
Made by Buckeye Mfg. Co.

Kenon 1500-lb. Panel, \$1750.
Also Stake, \$1700; Flareboard, \$1675.

O. K. Model C, 1500-lb. Panel, \$975.
Also Flareboard, \$925; Canopy Top, \$950.
Made by W. A. Patterson Co.



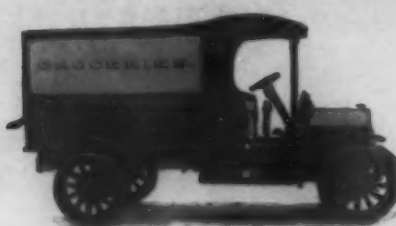
Jeffery Model 1514, 1500-lb. Panel, \$1650.

International Model E, 1500-lb. Canopy Top.
Made by International Harvester Corp.

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Landshaft Model C4, 1500-lb. Express, Chassis, \$1075.
Also Panel, \$1125; Stake, \$1175; Flareboard, \$1150.



Diamond-T Model J-1, 2000-lb. Panel, Chassis, \$2000.



Gay Model F, 2000-lb. Flat Side Stake, \$1000.



Lambert Model V2, 2000-lb. Stake, \$1600.
Also Flareboard, \$1800.
Made by Buckeye Mfg. Co.



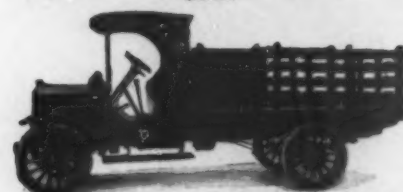
Dart Model B, 2000-lb. Flareboard, \$1407.
Also Panel, \$1550; Stake, \$1480.



Palmer-Meyer 2000-lb. Canopy Top, Chassis, \$1600.



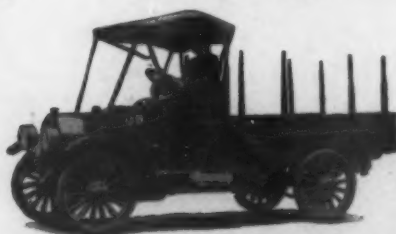
Republic Model C, 2000-lb. Stake, Chassis, \$1350.



Service Model W, 2000-lb. Flat Side Stake, Chassis, \$2000.



Denby Model B, 2000-lb. Stake, \$1715.
Also Flareboard, \$1693.



Gay Model F, 2000-lb. Sided Stake, \$1000.
Also Panel, \$1675; Stake, \$1575; Flareboard, \$1575.



Fargo Model F, 2000-lb. Open Side Covered Body, Chassis, \$1250.
Also Panel, \$1500; Stake, \$1350; Flareboard, \$1400.

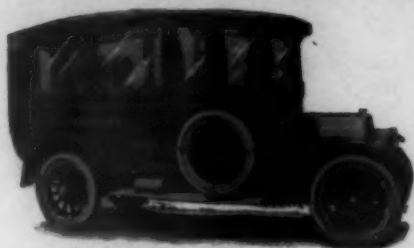
1500 Pound Gasoline Commercial Cars

Model	Chassis Weight	Chassis Price	Style of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled
.....	2500	1600	Stegeman Motor Car Co., Milwaukee, Wis.	125	39	20	23	4	3.75	5.25	B	C
.....	2200	1085	Studebaker Corp., Detroit, Mich.	108	..	20	20	4	3.5	5	B	C
C4	2700	1075	Wm. Landshaft & Sons, Chicago, Ill.	117	36	18	20	4	3.5	5.13	B	T
WB	1650	1600	Wisconsin Motor Truck Works, Baraboo, Wis.	130	32	15	23	4	3.75	5.75	P	C
WB	3200	1600	P. S. F.	126	32	18	23	4	3.75	5.75	P	C
B	2000	1050	Bauer Machine Works Co., Kansas City, Mo.	110	34	25	23	4	3.75	5	B	C

2000 Pound Gasoline Commercial Cars

.....	2850	.....	Available Truck Co., Chicago, Ill.	132	36	18	20	4	3.5	5	B	T
C	3770	1690	Avery Co., Peoria, Ill.	128	..	16	27	4	4.13	5.25	B	C
V-3	4000	1700	Buckeye Mfg. Co., Anderson, Ind.	120	32	12	27	4	4.13	5.25	B	C
B	2800	1400	Dart Motor Truck Co., Waterloo, Ia.	114	32	20	20	4	3.5	5	B	T
B	3200	1600	Denby Motor Truck Co., Detroit, Mich.	120	31	18	20	4	3.5	5	B	T
.....	4218	2000	Detroit-Wyandotte Motor Co., Wyandotte, Mich.	145	38	19	27	4	4.13	5.25	B	G
J1	.....	2000	Diamond T Motor Car Co., Chicago, Ill.	127	..	18	23	4	3.75	5.25	B	C
C	2370	1370	Durant-Dart Carriage Co., Flint, Mich.	104	29	20	23	4	3.75	4.5	B	T
F	3200	1250	Fargo Motor Car Co., Chicago, Ill.	130	40	18	23	4	3.75	5	B	T
F	2460	1500	S. G. Gay Co., Ottawa, Ill.	115	36	15	23	4	3.75	4.5	P	W
M	1750	1750	Ideal Auto Co., Ft. Wayne, Ind.	124	44	15	27	4	4.13	5.25	B	C
.....	3400	1850	Kissel Motor Car Co., Hartford, Wis.	140	32	15	32	4	4.5	5.25	P	C
1-D	3820	2200	Packard Motor Car Co., Detroit, Mich.	126	43	20	26	4	4	5.5	B	C
.....	2950	1600	Palmer-Meyer Motor Car Co., St. Louis, Mo.	118	40	18	23	4	3.75	5	B	C
B-3	3500	1400	D. F. Poyer Co., Menominee, Mich.	122	..	16	26	4	4	5	P	T
B-3	3500	1450	P. F. E.	130	..	16	26	4	4	5	P	T
C	3250	1350	Republic Motor Truck Co., Alma, Mich.	124	39	15	23	4	3.75	5.5	B	C
W	3540	2000	Service Motor Truck Co., Wabash, Ind.	140	35	15	23	4	3.75	5.5	B	C
D	3200	1400	Signal Motor Truck Co., Detroit, Mich.	120	32	15	23	4	3.75	5.25	B	C
DL	3250	1450	P. S. F.	144	32	15	23	4	3.75	5.25	B	C
F	3200	1500	P. S. F.	120	32	15	23	4	3.75	5.25	B	C
FL	3250	1550	P. S. F.	144	32	15	23	4	3.75	5.25	B	C
G	3100	1250	Wm. Landshaft & Sons, Chicago, Ill.	124	36	15	20	4	3.5	5.13	B	T

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Kissel-Kar 2000-lb. Florist Delivery, Chassis, \$1250.
Also Stake, \$1975.



Signal Model D, 2000-lb. Canopy Top, Chassis, \$1400.
Also Panel, \$1625; Stake, \$1525; Flareboard, \$1500.



Stageman 1500-lb. Panel, Chassis, \$1600.

1500 Pound Gasoline Commercial Cars

Radiator	Carburetor	Lubrication	Ignition	Spark-Plug Size	Clutch	Drive	Transmission	Speeds Forward	Front Tires	Rear Tires	Steering Wheel	Brake and Gear Levers	% Total Weight on Rear Wheels	Engine Starter
T	C	SF	E											
T	SL	SF	R											
H	R	S	R											
H	H	SF	R											
H	H	SF	B											
T	SL	SF	M											

2000 Pound Gasoline Commercial Cars

T	R	S	B	S										
T	R	F	H	S										
V	SL	SF	BR	S										
H	SB	SF	E	S										
T	SB	SF	E	S										
T	SB	SF	B	S										
H	R	S	B	S										
V	M	F	R	S										
T	R	F	B	S										
V	SB	SF	E	S										
V	SB	SF	B	S										
T	SB	S	B	S										
C	SP	F	B	S										
H	SB	F	B	S										
V	SB	SF	B	S										
V	SB	SF	B	S										
..	SB	SF	E	S										
C	SB	SF	E	S										
T	SB	S	E	S										
T	SB	S	E	S										
T	SB	S	E	S										
H	R	S	R	S										



Studebaker Model S, 1500-lb. Panel, \$1085.
Also Express, \$1085; Flareboard, \$1085.



Menominee Model B-2, 2000-lb. Flareboard, \$1500.
Also Stake, \$1500; Panel, \$1525.
Made by D. F. Poyer Co.



Horner 2000-lb. Chassis, \$5000.
Made by Detroit-Wyandotte Motor Co.



Ideal Model M, 2000-lb. Flareboard, \$1925.
Also Stake, \$1825.

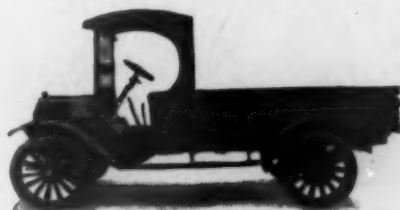


Signal Model F, 2000-lb. Chassis, \$1500.
Also Panel, \$1175; Stake, \$1650; Flareboard, \$1675.



Durant-Dort "Flint" Model C, 2000-lb. Open Express, \$1345.
Also Panel, \$1545; Canopy Top, \$1520; Screenside, \$1545.
Above prices with pneumatic tires; solid tires \$85 less.

BODY DETAILS OF CARS NOT ILLUSTRATED
Packard Model 1D, 2000-lb. Stake, \$6320.
Landshaft Model G, 2000-lb. Panel, \$1485.
Also Stake, \$1375; Flareboard, \$1350.

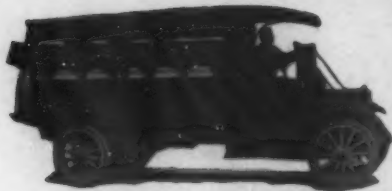


Available 2000-lb. Flareboard.



Avery Model C, 2000-lb. Canopy Top, Chassis, \$1250.
Also Panel, \$1910; Stake, \$1865; Flareboard, \$1775.

LAST HALF OF REVIEW. FIRST HALF WAS IN JANUARY ISSUE



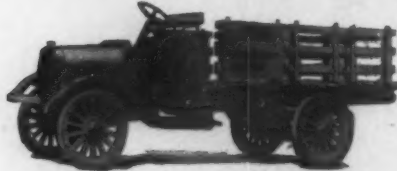
Federal Model K, 3000-lb. Covered Flareboard, \$2045.



Velle Model K, 3000-lb. Stake, \$2122.
Also Flareboard, \$2125.



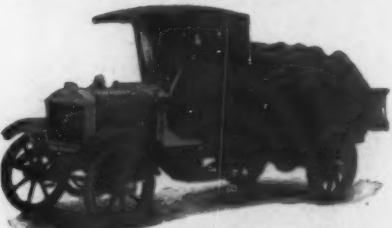
Wichita Model A, 3000-lb. Stake, \$1775.
Also Panel, \$1740; Stake, \$1765.



Aetna Model 225, 3000-lb. Stake, Chassis, \$2150.



Beck 3000-lb. Covered Flareboard, \$2000.
Also Panel, \$2000; Stake, \$2000; Flareboard, \$2000.



Crown Model B, 3000-lb. Flareboard, Chassis, \$2500.



De Kalb Model D-1, 3000-lb. Stake, Chassis, \$1950.



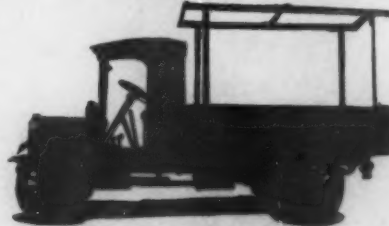
Doyle Model A-4, 3000-lb. Flareboard, Chassis, \$1950.
Also Panel, \$2075.



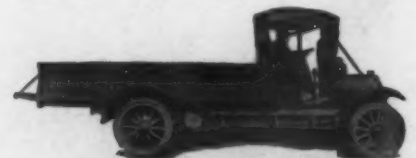
Danielson Model A, 3000-lb. Flareboard, Chassis, \$2500.



Diamond-T Model J-2, 3000-lb. Canopy Top, Chassis, \$2350.



Fargo Model G, 3000-lb. Covered Flareboard, \$1500.
Also Panel, \$1900; Stake, \$1750.



Federal Model K, 3000-lb. Flareboard, \$1945.



Hanco Model 20, 3000-lb. Canopy Top, Chassis, \$1925.
Made by National Motor Truck Co.

2000 Pound Gasoline Commercial Cars

Model	Chassis Weight	Chassis Price	Style of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled
20	2700	1925	National Motor Truck Co., Bay City, Mich.	104	34	15	20	4	3.5	5	B	T
X	2700	2000	Velle Motor Vehicle Co., Moline, Ill.	120	34	18	24	4	4.68	5.25	P	C
A	3050	1650	Wichita Falls Motor Co., Wichita Falls, Tex.	110	36	20	17	4	3.25	5	B	T
A	3050	1650	E. S.	144	36	20	17	4	3.25	5	B	T
LA	2000	2000	M. H. Wilson Motor Co., Minneapolis, Minn.	132	..	16	27	4	4.13	5.25	B	W

2500 Pound Gasoline Commercial Cars

VC	2900	1500	General Motors Truck Co., Pontiac, Mich.	126	40	14	20	4	3.5	5.25	B	C
			S, F, C, SS									

3000 Pound Gasoline Commercial Cars

225	3950	2150	Aetna Motor Truck Co., Detroit, Mich.	104	15	26	4	4	4.5	5	P	C
.....	4000	1600	Beck & Son, Cedar Rapids, Ia.	130	..	15	27	4	4.13	5.25	B	G
B	3900	2500	Crown Commercial Car Co., North Milwaukee, Wis.	140	36	18	26	4	4	5	B	C
A	3400	2200	Danielson Engine Works, Chicago, Ill.	130	36	25	29	4	4.25	4.25	S	G
D1	4300	1950	DeKalb Wagon Co., DeKalb, Ill.	134	43	14	27	4	4.13	5.25	B	C
.....	4320	2250	Detroit-Wyandotte Motor Co., Wyandotte, Mich.	145	40	18	27	4	4.13	5.25	B	G
J2	.....	2250	Diamond-T Motor Car Co., Chicago, Ill.	127	..	16	27	4	4.13	5.25	B	C
J2	.....	2250	.....	144	..	16	27	4	4.13	5.25	B	C
A-4	3800*	1950*	J. C. Doyle, Seattle, Wash.	112	25	30	23	4	3.75	5.25	B	G
G	3600	1600	Fargo Motor Car Co., Chicago, Ill.	140	35	18	29	4	4.25	5.5	B	G
G	3800	1900	Federal Motor Truck Co., Detroit, Mich.	120	42	15	27	4	4.13	5.25	B	C
H	3850	1800	S. F. SS, C	144	42	15	27	4	4.13	5.25	B	C
U	.....	1900	S. F. SS, C	120	42	15	27	4	4.13	5.25	B	C
K	.....	1900	S. F. SS, C	144	42	15	27	4	4.13	5.25	B	C
G	2650	1700	A. C. Gay Co., Ottawa, Ill.	120	36	15	26	4	4	4.5	P	W
G	2650	1700	P. S. F.	130	36	15	26	4	4	4.5	P	W
F	4000	1800	Harvey Motor Truck Works, Harvey, Ill.	130	29	16	23	4	3.75	5.5	B	C
.....	2000	Universal Motor Truck Co., Detroit, Mich.	120	..	15	23	4	3.75	5.25	B	T
.....	2050	C	120	..	15	23	4	3.75	5.25	B	T
.....	1950	120	..	15	23	4	3.75	5.25	B	T

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Wilcox Truck Model L-A, 3000-lb. Panel Chassis, \$3000.



GMC Model V-C, 2800-lb. Flareboard, \$1625. Also Stake, \$1625; Canopy Top, \$1670. Made by General Motors Truck Company.



Jeffery Model 3014, 3000-lb. Screenside, Chassis, \$1650. Also Express, \$1800.

2000 Pound Gasoline Commercial Cars

Radiator	Carburetor	Lubrication	Ignition	Spark-Plug Size	Clutch	Drive	Transmission	Speeds Forward	Front Tires	Rear Tires	Steering Wheel	Brake and Gear Levers	% Total Weight on Rear Wheels	Engine Starter
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T	Z	F	U	S	C	C	S	3	36x3 1/2	36x3 1/2	L	C	65	..
C	SB	S	B	S	D	B	S	3	36x5	36x4	L	C	80	E
H	SB	SF	B	S	C	C	S	3	34x3	34x4	R	C	75	..
H	SB	SF	B	S	C	C	S	3	34x3	34x4	R	C	75	..
V	BE	S	M	S	C	C	S	3	R	C

2500 Pound Gasoline Commercial Cars

T	K	SF	B	S	C	C	S	3	34x3	36x5	L	C	73	..
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3000 Pound Gasoline Commercial Cars

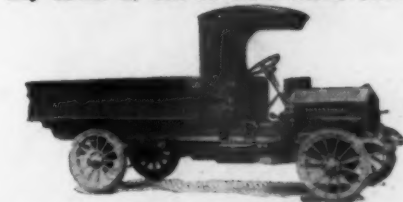
C	SL	F	E	M	D	W	S	3	3 1/2	..	L	C	75	..
T	SB	S	B	M	D	C	S	3	34x3 1/2	35x4	L	C	75	E
T	SB	SF	B	M	C	W	S	4	34x3 1/2	36x5	L	C	75	..
V	SL	S	B	S	C	C	S	3	36x3 1/2	37x4	L	C	65	..
V	SB	SF	M	S	C	C	S	3	34x3 1/2	36x5	L	C	67	..
T	SB	SF	B	S	D	C	S	3	36x4	36x5	L	C	63	..
H	R	S	B	S	D	W	S	3	36x3 1/2	36x5	R	C	..	..
H	R	S	B	S	D	W	S	3	36x3 1/2	36x5	R	C	..	..
C	SB	SF	B	S	J	C	D	3	34x4	34x5	O	O	65	X
T	R	F	B	S	F	U	S	3	34x4	34x5	L	C	75	..
C	SB	SF	E	S	C	C	S	3	36x3 1/2	36x5	L	C	76	..
C	SB	SF	E	S	C	C	S	3	36x3 1/2	36x5	L	C	70	..
C	SB	SF	E	S	C	W	S	3	36x3 1/2	36x5	L	C	..	..
V	SB	SF	E	S	C	W	S	3	36x3 1/2	36x5	L	C	..	..
V	SB	SF	E	S	C	U	S	3	3 1/2	4	L	C	80	..
H	H	SF	E	S	C	U	S	3	3 1/2	4	L	C	80	..
V	U	S	..	..	D	W	S	3	34x3 1/2	38x5	L	C	75	..
V	U	S	..	..	D	W	S	3	34x3 1/2	38x5	L	C	..	..
V	U	S	..	..	D	W	S	3	34x3 1/2	38x5	L	C	..	..



Federal Model H, 3000-lb. Screenside, \$2070.



Gay Model G, 3000-lb. Sided Stake, \$1800.



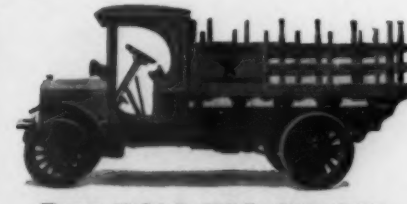
Independent Model H, 3000-lb. Flareboard, Chassis, \$1850.



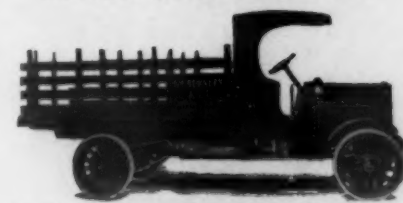
Federal Model G, 3000-lb. Tank Body, Chassis, \$1800. Also Stake, \$1945; Flareboard, \$1920; Screenside, \$2020; Canopy Top, \$1980; Canopy Top with Curtains, \$1995.



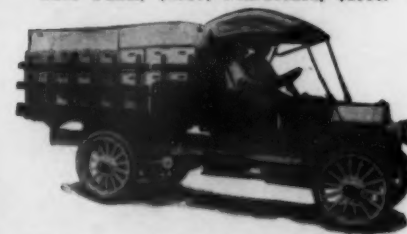
Ideal Model L, 3000-lb. Covered Stake, Chassis, \$3000. Also Stake, \$2085; Flareboard, \$2085.



Harvey Model F, 3000-lb. Stake, \$1950. Also Panel, \$1950; Flareboard, \$1950.



Ideal Model L, 3000-lb. Stake, Chassis, \$3000. Also Flareboard, \$2085.



Gay Model G, 3000-lb. Stake, \$1900. Also Panel, \$1850; Stake, \$1785; Flareboard, \$1785.

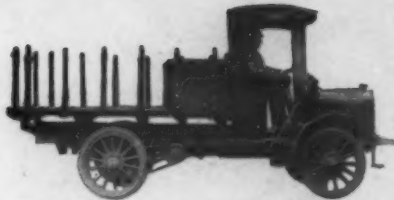


Federal Model H, 3000-lb. Canopy Top, \$2020. Also Stake, \$1970.

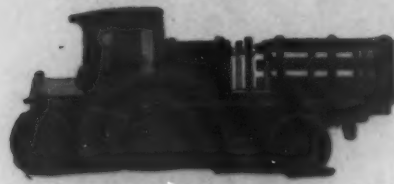
BODY DETAILS OF CARS NOT ILLUSTRATED
Federal Models J and K, 3000-lb. Stake, \$2070.

Also Flareboard, \$2045; Screenside, \$2170; Express with Top, \$2120; Express with Top and Curtains, \$2145.

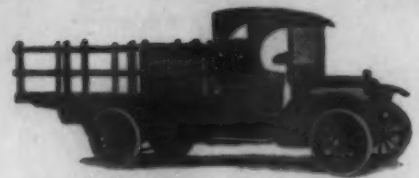
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Kalamazoo Model B, 3000-lb. Stake, \$1650.



Republic Model B, 3000-lb. Stake, Chassis, \$1475.



Jeffery Model 3014, 3000-lb. Stake, \$1975.



Kleiber Model 1, 3000-lb. Flareboard, \$2250.

Moon Model B, 3000-lb. Covered Flareboard, \$2100.
Also Stake, \$1950; Flareboard, \$1900; Stake, \$2100; Panel, \$2050; Flareboard, \$2000; Furniture, \$2200.Menominee Model C, 3000-lb. Stake, \$1950.
Also Flareboard, \$1950; Canopy Top, \$1950.
Made by D. F. Poyer Co.

Moreland 3000-lb. Flareboard, Chassis, \$3050.



Available 4000-lb. Stake.

Avery Model B, 4000-lb. Flareboard, \$2750.
Also Panel, \$3000; Stake, \$2675; Flareboard, \$2600.

3000 Pound Gasoline Commercial Cars

Model	Chassis Weight	Chassis Price	Styles of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled
L	4350	2000	Ideal Auto Co., Ft. Wayne, Ind.	144	45	14	37	4	4.13	5.25	B	C
L	4275	2000	S. F.	144	45	14	37	4	4.13	5.25	B	C
E	2680	1850	Independent Motors Co., Fort Huron, Mich.	122	15	15	23	4	3.75	4.13	B	C
E	3680	1850	.....	144	15	15	23	4	3.75	4.13	B	C
.....	3500	1650	Thomas E. Jeffery Co., Kenosha, Wis.	130	35	15	23	4	3.75	5.25	B	C
B	3200	1590	Kalamazoo Motor Vehicle Co., Kalamazoo, Mich.	126	39	15	23	4	3.75	5.6	B	C
.....	3600	1950	Kenon Mfg. Co., Long Beach, Cal.	132	34	15	27	4	4.13	5.25	B	C
.....	4400	2100	Kissel Motor Car Co., Hartford, Wis.	132	43	13	29	4	4.25	5.25	P	C
I	3700	2000	Kleiber & Co., San Francisco, Cal.	140	32	18	27	4	4.13	5.25	B	C
W	4750	.....	W. H. McIntyre Co., Auburn, Ind.	144	46	12	27	4	4.13	5.25	P	T
D	5200	2800	Mais Motor Truck Co., Indianapolis, Ind.	132	31	15	13	2	4	5.25	B	C
G	5100	2750	.....	119	31	15	13	2	4	5.25	B	C
B	3410	1800	Jos. W. Moon Buggy Co., St. Louis, Mo.	125	38	18	23	4	3.75	5.25	B	C
B	3410	1850	P. S. F.	125	38	18	23	4	3.75	5.25	B	C
B	3410	1800	P. S. F.	140	38	18	23	4	3.75	5.25	B	C
B	3410	1850	P. S. F.	140	38	18	23	4	3.75	5.25	B	C
.....	2050	.....	Moreland Motor Truck Co., Los Angeles, Cal.	120	32	18	27	4	4.13	5.25	B	C
.....	3800	.....	Old Reliable Motor Truck Co., Chicago, Ill.	138	36	16	23	4	3.75	5	B	C
.....	4000	1950	Pacific Metal Products Co., Torrance, Cal.	144	31	18	27	4	4.13	5.25	B	C
C	3900	1800	D. F. Poyer Co., Menominee, Mich.	130	14	26	4	4	5	P	T	
C	3900	1850	S. F. C.	142	14	26	4	4	5	P	T	
D	3750	1475	Republic Motor Truck Co., Alma, Mich.	144	39	15	23	4	3.75	5.25	B	C
.....	1900	.....	Shadow Truck Co., Chicago, Ill.	140	16	23	4	3.75	5.25	B	G	
Q	4050	1975	Service Motor Truck Co., Wabash, Ind.	150	37	14	27	4	4.13	5.5	B	C
H	1700	.....	Signal Motor Truck Co., Detroit, Mich.	120	32	15	23	4	3.75	5.25	B	C
H	1750	.....	.....	144	32	15	23	4	3.75	5.25	B	C
30	3000	1750	South Bend Motor Car Works, South Bend, Ind.	130	31	17	26	4	4	5	B	W
30	3000	1750	P. S. F.	130	31	17	26	4	4	5	B	W
.....	3400	2100	Stegeman Motor Car Co., Milwaukee, Wis.	150	39	18	23	4	3.75	5.25	B	C
U	4200	2250	Velle Motor Vehicle Co., Moline, Ill.	140	36	16	34	4	4.65	5.25	P	C
A	3960	1800	J. C. Wilson Co., Detroit, Mich.	130	39	15	27	4	4.13	5.25	B	C
B	4260	1950	.....	130	39	15	27	4	4.13	5.25	B	C
J	3600	1500	Wm. Landshaft & Sons, Chicago, Ill.	124	36	14	23	4	3.75	5.5	B	C
WA	4000	2300	Wisconsin Motor Truck Works, Baraboo, Wis.	150	34	15	23	4	3.75	5.75	P	C
WA	4000	2300	P. S. F.	140	34	15	23	4	3.75	5.75	P	C
F	.....	2200	Robinson Motor Truck Co., Minneapolis, Minn.	120	15	24	4	4.13	5.25	B	..	
F	3600	1950	Universal Motor Truck Co., Detroit, Mich.	132	15	24	4	4.13	5.25	B	..	

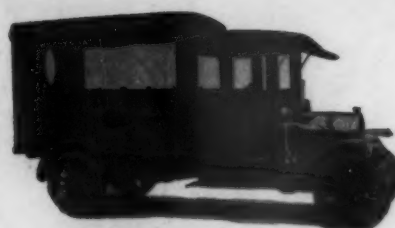
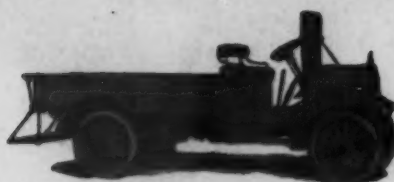
4000 Pound Gasoline Commercial Cars

Available Truck Co., Chicago, Ill.												
.....	4200	.....	.....	144	36	15	27	4	4.13	5.25	B	W
B	5450	2500	Avery Co., Peoria, Ill.	128	14	36	4	4.75	5	S	C	
V5	5500	2200	Huckey Mfg. Co., Anderson, Ind.	120	35	10	32	4	4.5	5	B	C
.....	4578	2650	Detroit-Wyandotte Motor Co., Wyandotte, Mich.	145	40	15	27	4	4.13	5.25	B	G
J-3	.....	2500	Diamond T Motor Car Co., Chicago, Ill.	144	14	27	4	4.13	5.25	B	C	
J-3	.....	2500	.....	160	14	27	4	4.13	5.25	B	C	
.....	2500	Dorris Motor Car Co., St. Louis, Mo.	144	15	31	4	4.38	5	P	C	
.....	2500	162	15	31	4	4.38	5	P	C	

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Wisconsin Model A-1 1/2, 3000-lb. Chassis, South Bend Model 30, 3000-lb. Flareboard, \$1550.



Sandow 3000-lb. Screenside, \$2150. Also Panel, \$2150; Stake, \$2100; Canopy Top, \$2075.

3000 Pound Gasoline Commercial Cars

Radiator	Carburetor	Lubrication	Ignition	Spark-Plug Size	Clutch	Drive	Transmission	Speeds Forward	Front Tires	Rear Tires	Steering Wheel	Brake and Gear Levers	% Total Weight on Rear Wheels	Engine Starter
V	SB	SF	B	1/2	B	C	S	3	36x4	36x5	R	C	68	E
V	SB	SF	B	1/2	B	W	S	3	36x4	36x5	R	C	68	E
C	ZP	SF	M	S	C	C	S	3	36x3 1/2	36x5	R	R	85	..
C	ZP	SF	M	S	C	C	S	3	36x3 1/2	36x5	R	R	85	..
V	SB	SF	R	..	D	C	S	3	34x3 1/2	34x5	L	C	70	X
T	SL	SF	B	S	C	C	S	3	37x3 1/2	37x5	R	R	70	..
C	SB	F	B	1/2	D	W	S	3	3 1/2	5	L	C	65	E
T	SB	S	B	S	C	C	S	4	24x3 1/2	38x5	L	C	70	..
C	SL	SF	B	S	D	C	S	3	.....	.....	R	C	75	..
H	SB	SF	B	S	D	C	S	3	34x3 1/2	36x3D	R	C	80	..
..	R	S	E	S	S	IG	P	3	37x4	37x5	L	L	68	..
..	R	S	E	S	S	IG	P	3	37x4	37x5	L	L	68	..
H	SB	..	R	..	C	C	S	3	3 1/2	4 1/2	L	C	80	..
H	SB	..	R	..	C	C	S	3	3 1/2	5	L	C	80	..
H	SB	..	R	..	C	C	S	3	3 1/2	4 1/2	L	C	80	..
H	SB	..	R	..	C	C	S	3	3 1/2	5	L	C	80	..
V	MA	SF	WS	S	D	W	S	3	24x3 1/2	34x5	R	C	60	..
H	C	F	B	S	D	W	S	3	34x3 1/2	36x6	R	C	..	..
T	SL	SF	B	1/2	C	C	S	3	26x3 1/2	26x4	L	C	75	..
T	SB	SF	B	1/2	D	SP	S	3	36x4	36x5	R	C	70	..
T	SB	SF	B	1/2	D	SP	S	3	36x4	36x5	R	C	70	..
..	SB	SF	E	1/2	C	C	S	3	35x3 1/2	35x5	L	C	55	..
H	SB	SF	B	S	D	C	S	3	36x3	26x4	R	C	75	..
C	SB	SF	E	S	C	C	S	3	36x2 1/2	36x5	L	C	70	..
T	SB	S	E	S	D	W	S	3	34x3 1/2	36x5	L	C	..	..
T	SB	S	E	S	D	W	S	3	34x3 1/2	36x5	L	C	..	..
C	SB	F	B	S	D	C	S	3	.....	.....	L	C	60	E
C	SB	F	B	S	D	W	S	3	.....	.....	L	C	60	E
T	C	SF	E	..	D	C	S	3	34x3 1/2	36x5	L	C	80	..
C	SB	S	B	S	D	W	S	3	36x4	36x3D	L	C	80	..
T	M	SF	E	2	C	C	S	3	37x3 1/2	37x5	L	C	71	..
T	M	SF	E	2	C	W	S	3	37x3 1/2	37x5	L	C	72	..
H	R	S	R	S	D	IG	S	3	34x3 1/2	36x4	O	C	70	..
H	H	SF	R	S	D	W	S	3	34x4	38x5	L	C	..	X
H	H	SF	B	S	D	W	S	3	34x4	38x5	L	C	..	X
..	..	..	..	..	..	..	..	3	36x4	36x4	..	..	..	..
V	..	S	M	..	D	W	S	3	34x3 1/2	35x5	L	C	..	..

4000 Pound Gasoline Commercial Cars

T	R	S	B	S	D	W	S	3	36x3 1/2	36x6	L	C	..	..
T	R	F	E	S	D	C	S	3	36x4	36x3 1/2D	R	C	70	..
V	SL	SF	BR	S	..	..	..	..	36x4	36x5	R	R	..	X
T	SB	SF	B	S	D	C	S	3	36x4	36x3 1/2D	L	C	66	..
H	R	S	B	S	D	W	S	3	36x4	36x6	R	C	..	..
H	R	S	B	S	D	W	S	3	36x4	36x6	R	C	..	..
H	SB	S	B	S	D	C	S	3	36x3 1/2	36x3 1/2D	L	C	80	..
H	SB	S	B	S	D	C	S	3	36x3 1/2	36x3 1/2D	L	C	80	..



Stageman 3000-lb. Panel, Chassis, \$2100.



Veile Model U, 3000-lb. Flareboard, \$2375. Also Stake, \$2375.



Wilson Model B, 3000-lb. Chassis, \$1950.



Lambert Model V5, 4000-lb. Covered Stake, Chassis, \$2200. Also Stake, \$2300; Flareboard, \$2300. Made by Buckeye Mfg. Co.



Derris Model 1-A-4, 4000-lb. Stake, Chassis, \$2500.

BODY DETAILS OF CARS NOT ILLUSTRATED

Kissel Kar 3000-lb. Stake, \$2225.

Also 10 ft. Stake, \$2250.

Keson 3000-lb. Stake, \$2050.

Also Flareboard, \$2050.

South Bend Model 30, 3000-lb. Panel, \$2000.

Also Stake, \$1950; Flareboard, \$1850.

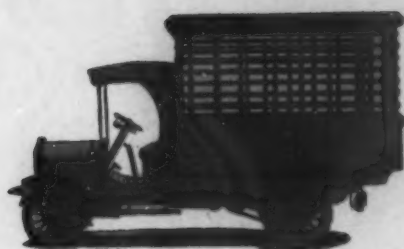
Wisconsin Model W-A, 3000-lb. Panel, \$2500.

Also Stake, \$2425; Flareboard, \$2450.

Landshaft Model J, 3000-lb. Panel, \$1700.

Also Stake, \$1625; Flareboard, \$1600.

LAST HALF OF REVIEW. FIRST HALF WAS IN JANUARY ISSUE



Dart Model C, 4000-lb. flat side covered Express, \$1910.
Also Flareboard, \$1900.



Diamond-T Model J-2, 4000-lb. Canopy Top, Chassis, \$2500.



Crown Model C, 5000-lb. Stake, Chassis, \$3000.

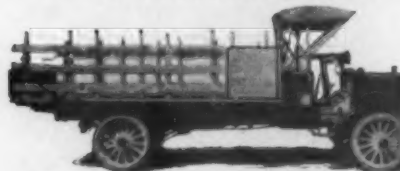


Four-Wheel Drive Model G, 4000-lb. Stake, Chassis, \$3000.



GMC Model S-C, 4000-lb. Raised Flareboard, Chassis, \$1900.

Also Stake, \$2050; Flareboard, \$2040; Canopy Top, 2090; Screenside, \$2120.
Made by General Motors Truck Co.



Wichita Model B, 4000-lb. Stake, \$2230.
Also Express, \$2200; Stake, \$2225.



Kleiber Model 2, 5000-lb. Coal Body, Chassis, \$2750.



Wichita Model B, 4000-lb. Screenside, \$2300.



Jeffery Quad 4000-lb. Army Wagon, Chassis, \$2750.
Also Stake, \$3050; Express.

4000 Pound Gasoline Commercial Cars

Model	Chassis Weight	Chassis Price	Style of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled
C	4200	2500	Duplex Power Car Co., Charlotte, Mich.	130	12	27	4	4.13	5.5	B	C	
G	4400	3600	Four Wheel Drive Auto Co., Clintonville, Wis.	124	36	16	32	4	4.5	5	P	..
SC	5050	1900	General Motors Truck Co., Pontiac, Mich.	143	40	12	26	4	4	6	B	C
R	5100	2500	S. F. C. S. S.	152	46	12	27	4	4.13	5.25	B	C
Quad	4900	2750	Ideal Auto Co., Ft. Wayne, Ind.	125	45	14	23	4	3.75	5.25	B	C
			Thomas B. Jeffery Co., Kenosha, Wis.	125	45	14	23	4	3.75	5.25	B	C
F	5400	3000	Wais Motor Truck Co., Indianapolis, Ind.	145	31	13	13	4	5.25	B	C	
E	5200	2950	Wais Motor Truck Co., Indianapolis, Ind.	132	31	13	13	4	5.25	B	C	
	5200	2360	Mogul Motor Truck Co., St. Louis, Mo.	138	..	18	27	4	4.13	5.25	P	..
	5200	2300	Mogul Motor Truck Co., St. Louis, Mo.	148	..	18	27	4	4.13	5.25	P	..
	4800		Old Reliable Motor Truck Co., Chicago, Ill.	120	38	14	25	4	4.25	5	P	C
2-D	5210	2800	Peckard Motor Car Co., Detroit, Mich.	144	42	16	26	4	4	5.5	B	C
	5000	2500	Pacific Metal Products Co., Torrance, Cal.	162	33	17	32	4	4.5	5.6	P	C
	4200	2250	Palmer-Mayer Motor Car Co., St. Louis, Mo.	144	42	15	27	4	4.13	5.25	B	C
J	4270	1650	See Motor Truck Co., Lansing, Mich.	130	42	12	27	4	4.13	4.5	P	C
J	4270	1650	See Motor Truck Co., Lansing, Mich.	146	42	12	27	4	4.13	4.5	P	C
		2250	Sandow Truck Co., Chicago, Ill.	141	14	27	4	4.13	5.25	B	G	
PW	4230	2500	Service Motor Truck Co., Wabash, Ind.	160	35	14	27	4	4.13	5.5	B	C
60	3600	1850	South Bend Motor Car Works, South Bend, Ind.	140	31	17	36	4	4.75	5.5	P	W
60	3600	1850	P. S. F.	140	31	17	36	4	4.75	5.5	P	W
	5400	2800	Sternberg Motor Truck Co., Milwaukee, Wis.	145	..	15	23	4	3.75	5.75	P	C
	5400	2800	Ware Motor Vehicle Co., St. Paul, Minn.	174	..	15	23	4	3.75	5.75	P	C
		3000	Wichita Falls Motor Co., Wichita Falls, Tex.	118	36	20	20	4	4.5	5.5	P	W
B	3450	2100	P. E. S. S.	118	36	20	20	4	3.5	5	B	T
B	3450	2100	P. E. S. S.	144	36	20	20	4	3.5	5	B	T
NA		2600	E. E. Wilcox Motor Co., Minneapolis, Minn.	118	..	14	29	4	4.25	5	P	W
C	3600	1800	Dart Motor Truck Co., Waterloo, Ia.	120	33	15	27	4	4.13	5.5	B	C
C	3600	1800	S. F.	144	33	15	27	4	4.13	5.5	B	C
D		2500	Robinson Motor Truck Co., Minneapolis, Minn.	126	..	..	..	..	..	..	P	W
		2800	Universal Motor Truck Co., Detroit, Mich.	132	..	13	26	4	5.5	P	C	

5000 Pound Gasoline Commercial Cars

100	4875	2400	Aetna Motor Truck Co., Detroit, Mich.	140	40	14	31	4	4.38	6	P	C
C	4500	3000	Crown Commercial Car Co., North Milwaukee, Wis.	160	36	15	29	4	4.25	5	P	C
D-2	5000	2450	DeKalb Wagon Co., DeKalb, Ill.	136	43	12	27	4	4.13	5.25	B	C
.....	..	2700	Dorris Motor Car Co., St. Louis, Mo.	144	..	15	31	4	4.38	5	P	C
.....	..	2700	Kenner Mfg. Co., Long Beach, Cal.	142	..	15	31	4	4.38	5	P	C
.....	5200	2400	S. F.	144	34	12	32	4	4.5	5.5	P	C
.....	5300	2750	Kissel Motor Car Co., Hartford, Wis.	144	43	12	32	4	4.5	5.5	P	C
2	4250	2750	Kleiber & Co., San Francisco, Cal.	150	33	16	27	4	4.13	5.25	B	C
21	5200	2900	Lewis Motor Truck Co., Oakland, Cal.	144	36	14	29	4	4.25	5	P	C



Duplex Model B, Four-Wheel Drive, 4000-lb. Chassis, \$2900.



KisselKar 5000-lb. Stake, Chassis, \$2900.
Also 12 ft. Stake, \$2900.

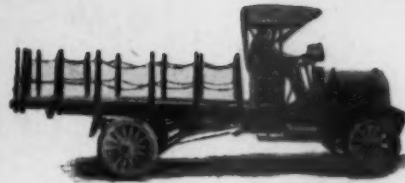
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Randow 4000-lb. Canopy Top, \$2500.
Also Panel \$2550; Stake, \$2500.



Palmer-Meyer 4000-lb. Stake, Chassis, \$2000.



Lewis, Model 21, 5000-lb. Stake, Chassis, \$2900.

4000 Pound Gasoline Commercial Cars

Radiator	Carburetor	Lubrication	Ignition	Spark-Plug Size	Clutch	Drive	Transmission	Speeds Forward	Front Tires	Rear Tires	Steering Wheel	Brake and Gear Levers	% Total Weight on Rear Wheels	Engine Starter
T	SL	SF	O	S	D	IG	S	3	35x4	35x4	L	C	60	..
H	SB	F	B	..	D	B	S	3	36x4	36x4	R	R	55	..
T	K	SF	B	S	C	C	S	3	34x4	36x3 1/2 D	L	C	71	..
V	SB	SF	B	1/2	B	W	S	3	36x4	36x4 D	R	C	76	E
H	SB	SF	B	..	D	IG	S	4	36x5	36x5	L	C	55	..
..	R	S	E	S	S	IG	P	3	37x4	37x4 D	L	L	63	..
..	R	S	E	S	S	IG	P	3	37x4	37x4 D	L	L	63	..
H	SB	..	E	S	C	C	L	3	..	..	L	C	..	..
H	SB	..	E	S	C	C	L	3	..	..	L	C	..	..
H	SB	F	B	S	D	C	S	3	34x4	36x4 D	R	R	60	..
C	SP	F	B	..	D	W	P	3	34x4	36x4 D	L	L	90	X
H	SL	SF	B	1/2	C	C	S	3	36x4	36x3 1/2 D	L	C	75	..
H	SB	F	B	1/2	D	C	S	3	36x4	36x4 D	L	C	65	..
T	H	SF	N	1/2	D	C	S	3	36x4	36x3 D	L	C	60	..
T	H	SF	N	1/2	D	C	S	3	36x4	36x3 D	L	C	60	..
H	SB	SF	B	S	D	C	S	3	36x4	36x4 D	R	C	75	..
C	SB	SF	E	S	C	W	S	3	36x4	36x4 D	L	C	65	..
C	SB	F	B	S	D	W	S	3	..	..	L	C	60	E
C	SB	F	B	S	D	W	S	3	..	..	L	C	60	E
H	H	..	E	..	D	W	S	3	36x3 1/2	36x3 1/2 D	L	C	..	..
H	H	..	E	..	D	W	S	3	36x3 1/2	36x3 1/2 D	L	C	..	..
T	SB	S	M	1/2	D	..	..	..	..	..	R	C	..	..
H	SB	SF	B	S	C	C	S	3	34x3 1/2	34x3 D	R	C	75	..
H	SB	SF	B	S	C	C	S	3	34x3 1/2	34x3 D	R	C	75	..
V	BE	S	B	S	C	C	S	3	..	..	R	R	..	..
H	SB	S	E	S	C	C	S	3	34x4	38x4	L	C	70	..
H	SB	S	E	S	C	C	S	3	34x4	38x4	L	C	70	..
..
C	U	S	..	..	D	C	S	3	36x4	36x3 D	R	R	..	..

5000 Pound Gasoline Commercial Cars

C	SL	F	E	M	D	W	S	3	34	..	L	C	75	..
T	SB	SF	B	M	C	W	S	4	34x4	36x6	L	C	75	..
V	SB	SF	M	S	C	C	S	3	36x4	36x6	L	C	67	..
H	SB	S	B	S	D	C	S	3	36x4	36x4 D	L	C	80	..
H	SB	S	B	S	D	C	S	3	36x4	36x4 D	L	C	80	..
C	SB	F	B	1/2	D	W	S	3	3 1/2	3 1/2 D	L	C	65	E
T	SB	S	B	S	C	C	S	4	36x4	38x4 D	L	C	70	..
C	SL	SF	B	S	K	l	C	S	2	..	R	C	75	..
H	R	F	B	S	D	C	IC	3	34x4	36x3 1/2 D	R	R	70	..



Wisconsin Model A-2, 4000-lb. Flareboard, Chassis, \$2000.



Rec Model J, 4000-lb. Canopy Top, Chassis, \$1650.



Wilcox Trux Model W-2, 4000-lb. Flareboard, Chassis, \$2000.



Wichita Model B, 4000-lb. Tank Body, \$2250.



De Kalb Model D-2, 5000-lb. Flareboard, Chassis, \$2450.



Ideal Model B, 4000-lb. Chassis, \$2500.
Also Stake, \$2600; Flareboard, \$2600.



Pierce-Arrow 4000-lb. Stake, \$2150.

BODY DETAILS OF CARS NOT ILLUSTRATED
Packard Model 2-D, 4000-lb. Stake, \$2900.
South Bend Model 60, 4000-lb. Panel, \$2950.
Also Stake, \$2000; Flareboard, \$1950.
Kenon 5000-lb. Stake, \$2500.

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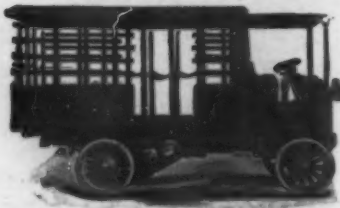
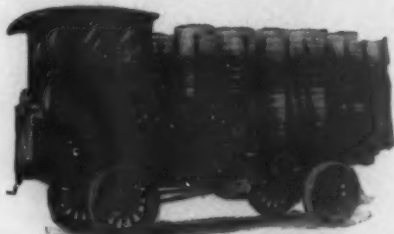
Stegeman 5000-lb. Stake, Chassis, \$2500.



Lewis Model 31, 6000-lb. Stake, Chassis, \$3200.



Stais Model G, 5000-lb. Stake, Chassis, \$2900.

Velle Model Y, 5000-lb. Dump Body, Chassis, \$2850.
Also Stake, \$3000.Avery Model B, 6000-lb. Covered Stake, Chassis, \$3200.
Also Panel, \$3475; Stake, \$3475; Flareboard, \$3200.

Four-Wheel Drive Model B, 6000-lb. Stake, Chassis, \$4000.

Avery Model A, 6000-lb. Farm Truck, \$2500.
Also Flareboard, \$2550.

Standard Model 30, 6000-lb. Flat Side Stake, Chassis, \$2750.

GMC Model H-U, 7000-lb. Coal Body, Chassis, \$2800.
Also Stake, \$2670; Flareboard, \$2670.
Made by General Motors Truck Co.

Nevada Model A, 6000-lb. Four-wheel Drive Stake, Chassis, \$3300.



Diamond-T Model L, 6000-lb. Panel, Chassis, \$3000.

5000 Pound Gasoline Commercial Cars

Model	Chassis Weight	Chassis Price	Styles of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled
G	5500	3200	Stais Motor Truck Co., Indianapolis, Ind.	145	31 1/2	15	2	4.31	5.25	B	C	
.....	.....	2650	Moreland Motor Truck Co., Los Angeles, Cal.	144	35 1/2	32	4	4.5	5.5	P	C	
P	4500	2375	Service Motor Truck Co., Wabash, Ind.	150	35 1/2	27	4	4.13	5.5	B	C	
.....	4250	2800	Stegeman Motor Car Co., Milwaukee, Wis.	145	39 1/2	15	4	4.12	5.25	B	C	
.....	4250	2800	.....	162	39 1/2	15	4	4.12	5.25	B	C	
Y	5500	2850	Velle Motor Vehicle Co., Moline, Ill.	148	46 1/2	15	32	4	4.5	5.5	P	C

6000 Pound Gasoline Commercial Cars

B	6250	3200	Avery Co., Peoria, Ill.	128	..	12	36	4	4.75	5	S	C
Farm	5875*	2500*	P. S. F.	140	..	13	36	4	4.75	5	S	C
.....	4800	1800	Beck & Son, Cedar Rapids, Ia.	140	..	13	36	4	4.75	5.75	B	G
.....	6350	3200	Detroit-Wyandotte Motor Co., Wyandotte, Mich.	145	48	12	32	4	4.5	5.5	P	G
L	....	3600	Diamond T Motor Car Co., Chicago, Ill.	160	..	12	32	4	4.5	5.5	P	C
C	4400	2800	Duplex Power Car Co., Charlotte, Mich.	130	..	12	27	4	4.13	5.5	B	C
B	6000	4000	Four Wheel Drive Auto Co., Clintonville, Wis.	124	45	14	36	4	4.75	5	P	C
H	8200	3000	Harvey Motor Truck Works, Harvey, Ill.	168	42	10	29	4	4.25	5.5	B	C
31	5600	3200	Lewis Motor Truck Co., Oakland, Cal.	144	36	12	29	4	4.25	5	P	C
G	5650	3600	W. H. McIntyre Co., Auburn, Ind.	144	48	8	27	4	4.13	5.25	P	T
H	5600	3400	Stais Motor Truck Co., Indianapolis, Ind.	160	31	12	15	2	4.31	5.25	B	C
A	6900	3500	Nevada Truck & Tractor Co., Nevada, Ia.	142	38	12	32	4	4.5	6.75	P	G
.....	6000	.....	Old Reliable Motor Truck Co., Chicago, Ill.	120	38	14	29	4	4.25	5	P	C
3D	6900	3400	Packard Motor Car Co., Detroit, Mich.	156	45	14	32	4	4.5	5.5	B	C
.....	7000	3150	Pacific Metal Products Co., Torrance, Cal.	141	37	14	32	4	4.5	5.5	P	C
.....	.....	3000	Sandow Truck Co., Chicago, Ill.	141	37	12	32	4	4.5	5.5	B	G
H	6000	2975	Service Motor Truck Co., Wabash, Ind.	171	46	11	29	4	4.25	5.5	B	C
30	.....	2750	Standard Motor Truck Co., Detroit, Mich.	144	36	12	32	4	4.5	5.5	P	C
60	.....	2950	.....	144	36	10	32	4	4.5	5.5	P	C
.....	6350	3400	Sternberg Motor Truck Co., Milwaukee, Wis.	158	..	13	29	4	4.25	5.75	P	C
.....	6350	3400	.....	194	..	13	29	4	4.25	5.75	P	C
.....	.....	3400	Universal Motor Truck Co., Detroit, Mich.	132	..	12	26	4	4	5.5	P	C
.....	.....	3400	.....	150	..	12	26	4	4	5.5	P	C
.....	.....	3000	Ware Motor Vehicle Co., St. Paul, Minn.	150	48	15	32	4	4.5	5.5	P	W
FA	.....	2250	W. B. Wilcox Motor Co., Minneapolis, Minn.	..	..	13	29	4	4.25	5	P	W

7000 Pound Gasoline Commercial Cars

HU	7740	2500	General Motors Truck Co., Pontiac, Mich.	185	48 1/2	40	4	5	5	P	C
.....	7300	3350	Kissel Motor Car Co., Hartford, Wis.	162	48 1/2	38	4	4.88	5	P	C
3	6500	3300	Kleiber & Co., San Francisco, Cal.	160	34 1/2	32	4	4.5	5.5	P	C
.....	5600	3350	Stegeman Motor Car Co., Milwaukee, Wis.	155	43 1/2	32	4	4.5	5.5	P	C
.....	5600	3350	175	43 1/2	32	4	4.5	5.5	P	C

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Lewis Model 31, 6000-lb. Tank Body, Chassis, \$3200.



Sandow 6000-lb. Moving Van, \$3200. Also Panel, \$3350; Stake, \$3300; Flareboard, \$3300; Moving Van, \$3500.



Service Model H, 6000-lb. Canopy Top, Chassis, \$2975.

5000 Pound Gasoline Commercial Cars

Radiator	Carburetor	Lubrication	Ignition	Spark-Plug Size	Clutch	Drive	Transmission	Speeds Forward	Front Tires	Rear Tires	Steering Wheel	Brake and Gear Levers	% Total Weight on Rear Wheels	Engine Starter
..	R	S	E	S	S	IC	P	3	37x5	37x4D	L	L	68	..
V	MS	SF	WS	S	D	W	S	3	34x4	34x4D	R	C	60	..
C	SB	SF	E	S	C	C	S	3	36x4	40x3 1/2 D	L	C	75	..
T	C	SF	E	..	D	C	S	3	34x3 1/2	36x3 1/2 D	L	C	80	..
T	C	SF	E	..	D	C	S	3	34x3 1/2	36x3 1/2 D	L	C	80	..
C	SB	S	B	S	D	C	S	3	36x4	36x4D	R	R	80	..

6000 Pound Gasoline Commercial Cars

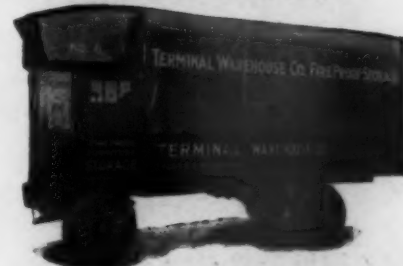
C	R	F	E	S	D	C	S	3	38x5	38x4D	R	C	70	..
T	R	F	E	S	D	C	S	3	W	W	R	C	..	..
T	SB	S	B	M	D	C	S	3	34x1 1/2	38x3D	L	C	75	E
T	SB	SF	B	S	D	C	S	3	36x5	40x4D	L	C	66	..
H	R	S	B	S	D	W	S	3	36x5	38x5D	R	C	..	..
T	SL	SF	O	S	D	IG	S	3	35x5	35x5	L	C	60	..
H	SB	F	B	S	D	B	IC	3	..	..	R	R	55	..
H	H	SF	E	S	C	C	S	4	36x5	40x5D	L	C	75	..
H	R	F	B	S	D	C	IC	3	34x4	36x5D	R	R	70	..
H	SB	SF	B	S	D	C	S	3	36x4	36x4D	R	C	80	..
..	R	S	E	S	S	IG	S	3	37x5	37x5D	L	L	68	..
T	H	SF	B	S	C	R	S	3	36x6	36x6	R	R	50	..
H	SB	F	B	S	D	C	S	3	34x5	36x5D	R	R	60	..
C	SP	F	B	..	D	W	P	3	36x5	36x5D	L	L	90	X
H	SL	SF	B	1/2	C	C	S	3	36x5	36x4D	R	R	75	..
H	SB	SF	B	S	D	C	S	3	36x5	36x5D	R	C	75	..
C	SB	SF	E	S	C	C	S	3	36x5	40x5D	L	C	74	..
H	SB	SF	E	S	D	C	S	3	.....	.....	L	C	75	..
H	SB	SF	E	S	D	W	S	3	.....	.....	L	C	75	..
..	H	..	E	..	D	W	S	3	36x4	36x4D	L	C	..	..
..	H	..	E	..	D	W	S	3	36x4	36x4D	L	C	..	..
C	U	S	..	..	D	C	S	3	36x5	36x4D	R	R	..	..
C	U	S	..	..	D	C	S	3	36x5	36x4D	R	R	..	..
T	SB	S	M	1/2	D	C	S	2	..	..	R	C	..	..
V	BE	S	B	S	C	C	S	3	..	..	R	R	..	..

7000 Pound Gasoline Commercial Cars

T	M	SF	M	S	D	C	P	3	36x5	42x5D	L	C	71	..
T	SB	S	B	S	C	C	S	4	36x5	40x5D	L	C	70	..
C	SL	SF	B	S	D	C	S	3	..	..	R	C	75	..
T	C	SF	E	..	D	C	S	3	36x4	40x4D	L	C	80	..
T	C	SF	E	..	D	C	S	3	36x4	40x4D	L	C	80	..



Ware 6000-lb. Stake, \$3200.



Wilcox Truck Model J-A, 6000-lb. Covered Furniture Body, Chassis, \$3350.



Sterling 6000-lb. Canopy Top, Chassis, \$3400. Made by Sternberg Motor Truck Co.



Kissel-Kar 7000-lb. Dumping Body, Chassis, \$3350. Also Stake, \$3500.



Stagecoach 7000-lb. High Stake, Chassis, \$3300.



Kleiber Model 3, 7000-lb. Bottle Body, Chassis, \$3300.

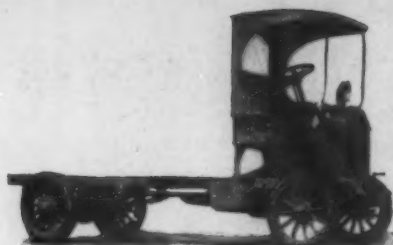


Packard Model 3-D, 6000-lb. Stake, \$3550.

BODY DETAILS OF CARS NOT ILLUSTRATED

Beck 6000-lb. Panel, \$2850. Also Stake, \$2250; Flareboard, \$2250. Harvey Model H, 6000-lb. Panel, \$3300. Also Stake, \$3300; Flareboard, \$3300.

LAST HALF OF REVIEW. FIRST HALF WAS IN JANUARY ISSUE



Moreland 7000-lb. Chassis, \$3500.

GMC Model 2-E, 10,000-lb. Stake Bed Stake Chassis, \$3000.
Made by General Motors Truck Co.

Smith-Milwaukee Model A, 8000-lb. Covered Stake Chassis, \$3750.



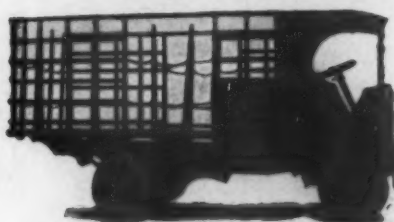
Wichita Model H, 7000-lb. Power Dump Body, \$3750.



De Kalb Model D-4, 8000-lb. Chassis, \$3600.

Avery Model B, 10,000-lb. Stake Chassis, \$4500.
Also Panel, \$5090; Stake, \$4700; Flareboard, \$4600.

Lewis Model 51, 10,000-lb. Stake Chassis, \$4400.

Lewis Model 51, 10,000-lb. Dump Body, \$4650.
Old Reliable 10,000-lb. Stake.

Old Reliable, 10,000-lb. Stake

BODY DETAILS OF CARS NOT ILLUSTRATED
South Bend Model 30, 8000-lb. Panel, \$3050.
Also Stake, \$3000; Flareboard, \$2950.
Packard Model 4-D, 8000-lb. Stake, \$3980.

Model	Chassis Weight	Chassis Price	Styles of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled
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.....	3500	Moreland Motor Truck Co., Los Angeles, Cal.	168	36	12	36	4	4.75	6.75	P	C
H	6100	3250	Wichita Falls Motor Co., Wichita Falls, Tex.	165	42	11	29	4	4.25	6.75	P	C
H	6100	3250	E. S. F. D.	165	42	11	36	4	4.75	6.75	P	C

7000 Pound Gasoline Commercial Cars

D-4	.....	3600	DeKalb Wagon Co., DeKalb, Ill.	136	.....	40	4	5	5.75	.....	P	C
.....	7200	.....	Old Reliable Motor Truck Co., Chicago, Ill.	126	39	12	36	4	4.75	5.5	P	C
4D	7293	3800	Packard Motor Car Co., Detroit, Mich.	156	49	14	32	4	4.5	5.5	B	C
.....	9000	2500	Pacific Metal Products Co., Torrance, Cal.	153	38	12	36	4	4.75	5.5	P	C
A	4800	3750	A. O. Smith Co., Milwaukee, Wis.	168	43	12	40	4	5	5.75	P	C
80	4300	2850	South Bend Motor Car Works, South Bend, Ind.	162	31	17	44	4	5.25	7	P	W
80	4300	2850	P. S. F.	162	31	17	44	4	5.25	7	P	W
Z	6500	3350	Velle Motor Vehicle Co., Moline, Ill.	172	46	12	32	4	4.5	5.5	P	C

10,000 Pound Gasoline Commercial Cars

B	7750	4500	Avery Co., Peoria, Ill.	128	.....	10	44	4	5.25	5.75	P	C
.....	8520	4200	Detroit-Wyandotte Motor Co., Wyandotte, Mich.	156	50	19	44	4	5.25	5.75	P	G
KU	8295	3000	General Motors Truck Co., Pontiac, Mich.	158	49	9	40	4	5	5	P	C
5	8000	4000	Kieffer & Co., San Francisco, Cal.	170	36	12	40	4	5	5.75	P	C
51	8200	4400	Lewis Motor Truck Co., Oakland, Cal.	144	42	10	36	4	4.75	5.5	P	C
.....	7300	4000	Moreland Motor Truck Co., Los Angeles, Cal.	168	40	10	36	4	4.75	6.75	P	C
.....	12000	4500	Old Reliable Motor Truck Co., Chicago, Ill.	126	39	12	36	4	4.75	5.5	P	C
.....	13500	4950	Pacific Metal Products Co., Torrance, Cal.	175	41	10	44	4	5.25	7	P	C
H	.....	3800	Robinson Motor Truck Co., Minneapolis, Minn.	144	.....	4	.....	.....	.....	.....	P	W
HX	7200	4000	Service Motor Truck Co., Wabash, Ind.	175	46	9	36	4	4.75	6.75	P	C
50	.....	3400	Standard Motor Truck Co., Detroit, Mich.	144	38	10	32	4	4.5	5.5	P	C
.....	.....	4200	Seegeman Motor Car Co., Milwaukee, Wis.	168	40	10	32	4	4.5	6.75	P	C
.....	8700	4500	Sternberg Motor Truck Co., Milwaukee, Wis.	148	48	11	32	4	4.5	5.75	P	C
Z5	7000	3750	Velle Motor Vehicle Co., Moline, Ill.	148	46	8	32	4	4.5	5.5	P	C
Z5	7000	3750	S	172	46	8	32	4	4.5	5.5	P	C

12,000 Pound Gasoline Commercial Cars

AC	10000	5400	Couple Gear Freight Wheel Co., Grand Rapids, Mich.	144	44	12	53	4	5.75	6	S	C
M	10000	4800	Four Wheel Drive Auto Co., Clintonville, Wis.	148	48	10	44	4	5.25	7	P	C
FV	6808	.....	General Vehicle Co., Long Island City, N. Y.	169	47	10	29	4	4.25	5.9	P	C
.....	7900	4350	Kiesel Motor Car Co., Hartford, Wis.	168	45	8	38	4	4.88	5	P	C
.....	10000	4600	Lewis Motor Truck Co., Oakland, Cal.	144	42	10	36	4	4.75	5.5	P	C
.....	.....	4400	Mogul Motor Truck Co., St. Louis, Mo.	166	.....	14	44	4	5.25	5.75	P	..
.....	.....	4500	Moreland Motor Truck Co., Los Angeles, Cal.	168	42	8	44	4	5.25	7	P	C
.....	5500	4750	A. O. Smith Co., Milwaukee, Wis.	168	47	12	44	4	5.25	5.75	P	C
.....	9125	4650	Sternberg Motor Truck Co., Milwaukee, Wis.	144	52	10	36	4	4.75	6.75	P	C

14,000 Pound Gasoline Commercial Cars

.....	9300	4750	Sternberg Motor Truck Co., Milwaukee, Wis.	144	52	10	36	4	4.75	6.75	P	C
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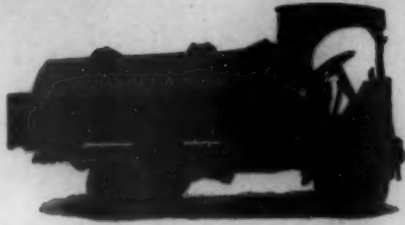
15,000 Pound Gasoline Commercial Cars

.....	Mogul Motor Truck Co., St. Louis, Mo.	142	44	4	5.25	5.75	P	..
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Gasoline Tractors

10000	5550	Couple Gear Freight Wheel Co., Grand Rapids, Mich.	96	50	12	53	4	5.75	6	S	C
.....	4500	.....	.....	144	.....	18	53	4	5.75	6	S	C
5800	3500	.....	Mercury Mfg. Co., Chicago, Ill.	72	.....	12	31	4	4.38	5.5	P	C

LAST HALF OF REVIEW. FIRST HALF WAS IN JANUARY ISSUE



Old Reliable 8000-lb. Tank Body.

Velle Model E-2, 10,000-lb. Chassis, \$3750.
Also Stake, \$3900.Wichita Model H, 7000-lb. Flareboard, \$3450.
Also Express, \$3450.

7000 Pound Gasoline Commercial Cars

Radiator	Carburetor	Lubrication	Ignition	Spark-Plug Size	Clutch	Drive	Transmission	Speeds Forward	Front Tires	Rear Tires	Steering Wheel	Brake and Gear Levers	% Total Weight on Rear Wheels	Engine Starter
V	MS	SF	WS	S	D	W	S	4	36x5	36x5D	R	C	60	..
H	SB	SF	B	S	D	C	S	3	36x5	36x5D	L	C	75	..
H	SB	SF	B	S	D	C	S	3	36x5	36x5D	L	C	75	..

8000 Pound Gasoline Commercial Cars

H	..	..	B	..	C	C	S	3	36x5	40x5D	..	..	..	..
H	SB	F	B	S	D	C	S	3	36x5	36x5D	R	R	60	..
C	SP	F	B	..	D	W	P	3	36x5	40x5D	L	L	90	X
H	SL	SF	B	..	C	C	S	3	36x5	36x5D	R	R	75	..
V	SB	SF	E	S	D	W	IC	3	36x5	36x5D	R	R	70	..
C	SB	F	B	S	D	C	S	3	..	..	R	R	60	E
C	SB	F	B	S	D	W	S	3	..	..	R	R	60	E
C	SB	S	B	S	D	C	S	3	36x5	40x5D	R	R	80	..

10,000 Pound Gasoline Commercial Cars

C	SL	F	E	S	D	C	S	3	38x6	38x6D	R	C	..	..
T	SB	SF	B	S	D	C	S	3	38x6	42x6D	L	C	60	..
T	M	SF	M	S	D	C	P	3	36x6	42x6D	L	C	73	..
C	SL	SF	D	S	D	C	S	3	..	..	R	C	75	..
H	R	F	B	S	D	C	IC	3	38x6	38x6D	R	R	60	..
V	MS	SF	WS	S	D	C	S	4	36x6	40x6D	R	R	60	..
H	SB	F	B	S	D	C	S	3	36x6	36x6D	R	R	60	..
H	SL	SF	B	S	D	C	S	4	36x6	42x6D	R	R	75	..
H	SL	SF	B	S	D	C	S	4	36x6	42x6D	R	R	75	..
..
C	SB	SF	E	S	D	C	S	4	36x6	40x6D	R	R	75	..
H	SB	SF	E	S	D	C	S	3	..	..	L	C	75	..
T	C	SF	E	..	D	C	S	3	36x6	40x6D	L	C	80	..
H	H	SF	E	..	D	W	IC	3	..	..	..	C	90	X
C	SB	S	B	S	D	C	S	3	36x6	40x6D	R	R	80	..
C	SB	S	B	S	D	C	S	3	36x6	40x6D	R	R	80	..

12,000 Pound Gasoline Commercial Cars

T	SB	SF	M	S	..	SP	E	..	36x5D	36x5D	R	L	55	X
H	SB	F	B	S	D	B	S	3	..	..	R	R	55	E
H	SP	SF	B	S	C	IG	S	4	34x5	40x6D	..	R	80	..
T	SB	S	B	S	C	C	S	4	36x6	40x6D	L	C	75	..
H	R	F	D	S	D	C	IC	3	36x6	38x6D	R	R	60	..
H	SB	..	M	S	C	C	L	3	..	..	L	C	..	..
V	MS	F	B	S	B	C	S	4	36x6	40x6D	R	R	60	..
V	SB	SF	E	S	D	W	IC	3	36x6	40x6D	R	R	70	..
H	H	SF	E	..	D	C	IC	3	R	R	65	..

14,000 Pound Gasoline Commercial Cars

H	H	SF	E	..	D	C	IC	3	R	R	65	..
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15,000 Pound Gasoline Commercial Cars

H	SB	..	M	S	C	C	L	3	L	C
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Gasoline Tractors

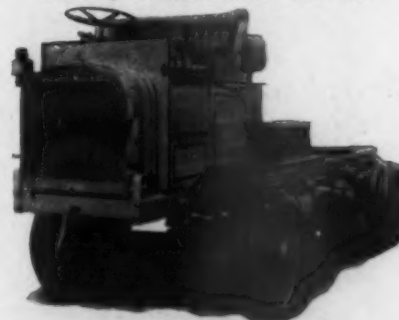
T	SB	SF	M	S	..	SP	E	..	36x5D	36x5D	R	C	60	X
T	SB	SF	M	S	..	SP	E	..	36x4D	..	R	C	65	X
T	SB	SF	R	S	D	C	S	3	34x4	38x4D	R	R	75	..



Velle Model E-4, 8000-lb. Stake, \$3500.



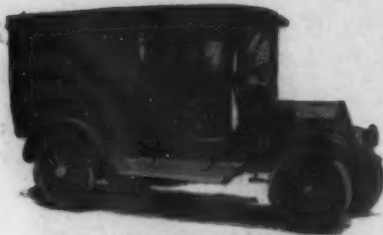
Stegeman Model 57, 10,000-lb. Covered Flareboard, Chassis, \$4200.

GMC Model K-U, 10,000-lb. Dump Body, \$3000.
Also Stake, \$3175; Flareboard, \$3175.
Made by General Motors Truck Co.

Four-Wheel Drive Model H, 12,000-lb. Chassis, \$4500.

American G. V. Dainler, 12,000-lb. Canopy Top.
Made by General Vehicle Co.Kissel-Kar 12,000-lb. Dumping Body, Chassis, \$4250.
Also Stake, \$4500.

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Walker Model G, 1000-lb. Panel.

GMC Model 1, 1000-lb. Side Door Panel, Chassis, without battery, \$1200.
Also Panel, \$2680; Stake, \$2365; Flareboard, \$2365.

Walker Model D, 6000-lb. Panel.

American-Argo Model E-20, 2000-lb. Flareboard, \$2120.
Also Stake, \$2150; Model L-20 Panel, \$2400.GMC Model 4, 4000-lb. Flat Side Body, Chassis, without battery, \$1650.
Also Panel, \$3845; Stake, \$3475, and Flareboard, \$1650.
Made by General Motors Truck Co.GMC Model 2, 2000-lb. Canopy Top, Chassis, without battery, \$1200.
Also Panel, \$3050; Stake, \$2685, and Flareboard, \$2685.
Made by General Motors Truck Co.Detroit Model 4, 4000-lb. Chassis, without battery, \$2200.
Made by Anderson Electric Car Co.

Walker Model M, 1000-lb. Panel.

Waverley 7000-lb. Screen-side, \$2800.
Also Stake, \$3750.Waverley 2000-lb. Chassis, \$2150.
Also Panel, \$2600; Stake \$2500, and Flareboard, \$2500.

750 Pound Electric Commercial Cars

Model	Chassis Weight	Chassis Price	Styles of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Mileage Per Charge	Motor Type
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..... 1200 1000* Connersville Suggy Co., Connersville, Ind.
P, S, F 80 31 14 60 S

1000 Pound Electric Commercial Cars

K10	2700	1750	American Electric Car Co., Saginaw, Mich.	S, F	86	32	14	60	S
L10	3100	1850	P	86	32	14	60	S	
1	2486	1200	General Motors Truck Co., Pontiac, Mich.	P, S, F	106	32	13	60	S
G	2100	.....	Walker Vehicle Co., Chicago, Ill.	.....	121	21	15	O	S
M	2000	.....	.....	O	35	15	O	S	
.....	2250	1800	Waverley Co., Indianapolis, Ind.	P, S, F	90	33	14	50	S

2000 Pound Electric Commercial Cars

K20	2900	2000	American Electric Car Co., Saginaw, Mich.	S, F	96	32	12	60	S
2	2780	1300	General Motors Truck Co., Pontiac, Mich.	P, S, F	118	32	12	60	S
K	2400	.....	Walker Vehicle Co., Chicago, Ill.	.....	121	34	14	O	S
.....	4600	2150	Waverley Co., Indianapolis, Ind.	P, S, F	104	40	11	45	S

3000 Pound Electric Commercial Cars

B2	4350*	2450*	J. C. Doyle, Seattle, Wash.	.....	112	24	16	65	SH
3	3061	1450	General Motors Truck Co., Pontiac, Mich.	P, S, F	130	32	11	60	S

4000 Pound Electric Commercial Cars

4	6100	2200	Anderson Electric Car Co., Detroit, Mich.	.....	128	42	10	45	S
4	4026	1650	General Motors Truck Co., Pontiac, Mich.	P, S, F	138	36	10	50	S
L	3000	.....	Walker Vehicle Co., Chicago, Ill.	.....	O	37	14	O	S
.....	6400	3000	Waverley Co., Indianapolis, Ind.	S	114	41	9	40	S

6000 Pound Electric Commercial Cars

6	4700	1900	General Motors Truck Co., Pontiac, Mich.	P, S, F	150	36	9	48	S
D	4500	.....	Walker Vehicle Co., Chicago, Ill.	.....	O	42	12	O	S

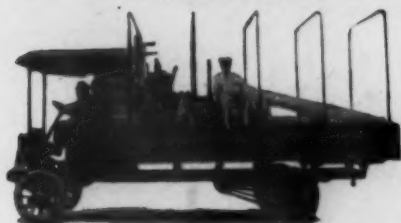
7000 Pound Electric Commercial Cars

H	8000	4250	Couple Gear Freight Wheel Co., Grand Rapids, Mich.	S, F, C	96	44	10	40	S
.....	8200	3400	Waverley Co., Indianapolis, Ind.	S	127	41	8	35	S

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Walker Model L, 4000-lb. Covered Express.



GMC Model 3, 3000-lb. Covered Flareboard;
Chassis, without battery, \$1450.
Also Panel, \$3585; Stake, \$3220, and Flare-
board, \$1450.
Made by General Motors Truck Co.



Waverley 1000-lb. Panel, \$2100; Chassis,
\$1500.
Also Stake, \$2000, and Flareboard, \$2000.

750 Pound Electric Commercial Cars

Battery Make	Battery Capacity	Controller Type	Speeds Forward	Drive	Rear Axle	Front Tires	Rear Tires	Steering and Control	% Total Weight on Rear Wheels
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P 204 .. Connersville Buggy Co., Connersville, Ind. 4 SP S 28x2 28x2 L ..

1000 Pound Electric Commercial Cars

EX 137 D American Electric Car Co., Saginaw, Mich. 4 B F 35x3 35x3 L 60
EX 137 D 4 B F 35x3 35x3 L 60
E 188 D General Motors Truck Co., Pontiac, Mich. 5 C D 32x3 32x3 1/2 L 60
O O D Walker Vehicle Co., Chicago, Ill. 5 IG D O 60
O O D 5 IG D O 60
S 135 K Waverley Co., Indianapolis, Ind. 4 H F 34x2 1/2 D+ 34x2 1/2 D+ L 60

2000 Pound Electric Commercial Cars

EX 137 D American Electric Car Co., Saginaw, Mich. 4 B F 35x3 1/2 35x3 1/2 L 60
E 225 D General Motors Truck Co., Pontiac, Mich. 5 C D 32x3 1/2 32x4 L 63
O O D Walker Vehicle Co., Chicago, Ill. 5 IG D O 60
S 189 .. Waverley Co., Indianapolis, Ind. 4 C D 35x4 35x5 L 60

3000 Pound Electric Commercial Cars

E .. J. C. Doyle, Seattle, Wash. 3 IG D 34x4 34x5 O 70
E 300 D General Motors Truck Co., Pontiac, Mich. 5 C D 32x4 32x5 L 64

4000 Pound Electric Commercial Cars

E 300 D Anderson Electric Car Co., Detroit, Mich. 5 C D 36x4 36x3 1/2 D .. 60
E 300 D General Motors Truck Co., Pontiac, Mich. 5 C D 32x4 36x3 1/2 D L 68
O O D Walker Vehicle Co., Chicago, Ill. 5 IG D O 60
S 216 .. Waverley Co., Indianapolis, Ind. 4 C D 37x5 37x4 D L 60

6000 Pound Electric Commercial Cars

E 375 D General Motors Truck Co., Pontiac, Mich. 5 C D 32x5 36x4 D L 68
O O D Walker Vehicle Co., Chicago, Ill. 5 IG D O 60

7000 Pound Electric Commercial Cars

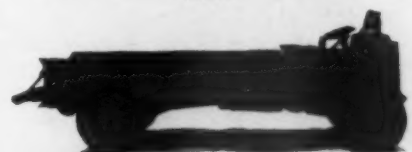
U 300 D Couple Gear Freight Wheel Co., Grand Rapids, Mich. 5 SP D 36x4 D 36x4 D R 50
S 270 .. Waverley Co., Indianapolis, Ind. 4 C D 37x6 37x5 D L 60



GMC Model 8, 6000-lb. Furniture Body, Chas-
sis, without battery, \$1900.
Also Panel, \$4615; Stake, \$4170, and Flare-
board, \$4170.
Made by General Motors Truck Co.



Connersville 750-lb. Express, \$1000.
Also Panel, \$1000; Stake, \$1000; Flareboard,
\$1000.

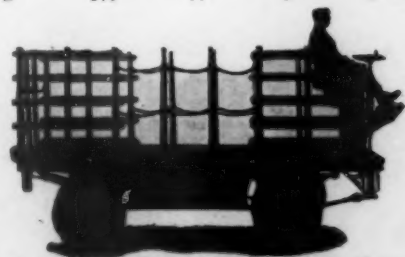


Doyle Model B2, 3000-lb. Express, \$2450.

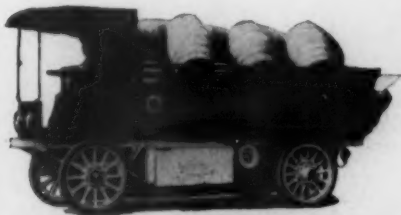


Walker Model K, 8000-lb. Panel.

BODY DETAILS OF CARS NOT ILLUSTRATED
American-Argo Model K-10, 1000-lb. Stake,
\$1900.
Also Flareboard, \$1900; Model L-10, Panel,
\$2150.

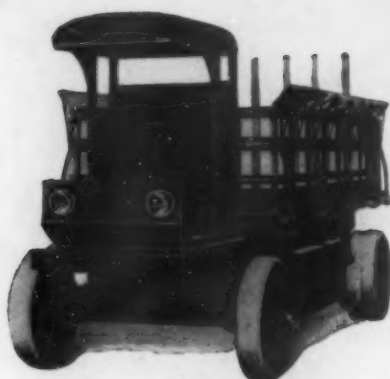


Couple Gear Model K, 7000-lb. Stake, \$4400.
Also Flareboard, \$4450; Top Type, \$4550.



Waverley 4000-lb. Express, \$3300; Chassis,
\$3000.

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Waverley 10,000-lb. flat side, \$4350.
Also Stake, \$4450.



GMC Model 12, 12,000-lb. Special Body, Chassis, without battery, \$3500.
Also Stake, \$5155, and Flareboard, \$5155.
Made by General Motors Truck Co.



Steele Model A, 10,000-lb. Chassis, \$4000.



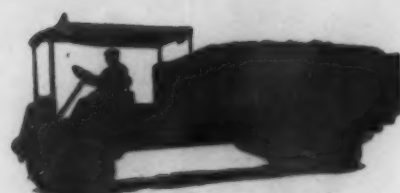
Witt-Will Model Q2-15, 8000-lb. Canopy Top, Chassis, \$2750.



Steele Model B, 6000-lb. Screenside, Chassis, \$3000.



GMC Model 8, 8000-lb. Stake Body, Chassis, without battery, \$2100.
Also Panel, \$4815; Stake, \$4370, and Flareboard, \$4370.
Made by General Motors Truck Co.



GMC Model 10, 10,000-lb. Coal Body, Chassis, without battery, \$2350.
Also Stake, \$5005, and Flareboard, \$2350.
Made by General Motors Truck Co.

8000 Pound Electric Commercial Cars

Model	Chassis Weight	Chassis Price	Style of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Mileage Per Charge	Motor Type
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S	4967	2100	General Motors Truck Co., Pontiac, Mich. P, S, F	156	36	8	42	S
E	5500	Walker Vehicle Co., Chicago, Ill. O	156	42	11	O	S

10,000 Pound Electric Commercial Cars

A	9000	4800	Couple Gear Freight Wheel Co., Grand Rapids, Mich. S, F, C	96	44	8	35	S
10	6208	2350	General Motors Truck Co., Pontiac, Mich. S, F	166	43	8	42	S
.....	9650	3950	Waverley Co., Indianapolis, Ind. S	136	41	7	30	S

12,000 Pound Electric Commercial Cars

AF	10000	4250*	Couple Gear Freight Wheel Co., Grand Rapids, Mich. S	108	40	8	40	S
12	6571	2500	General Motors Truck Co., Pontiac, Mich. S, F	174	43	7	38	S

Additions to Eastern Buyers' Review

Model	Chassis Weight	Chassis Price	Style of Stock Bodies Furnished	Wheelbase	Height of Loading Platform	Maximum Speed	Horse Power	Cylinders	Bore	Stroke	Cylinders Cast	How Cooled
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2000 Pound Gasoline Commercial Cars

E15	3600	1850	Witt-Will Co., Washington, D. C.	110	35	16	23	4	3.75	5.25	B	C
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4000 Pound Gasoline Commercial Cars

C	5700	2500	W. M. Steele, Worcester, Mass.	115	46	15	27	4	4.13	5.25	B	C
P2-15	4700	2250	Witt-Will Co., Washington, D. C.	116	44	14	27	4	4.13	5.25	B	C

6000 Pound Gasoline Commercial Cars

B	7600	3000	W. M. Steele, Worcester, Mass.	127	48	12	40	4	5	5	P	C
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8000 Pound Gasoline Commercial Cars

Q2-15	6500	2750	Witt-Will Co., Washington, D. C.	130	44	12	32	4	4.5	5.5	P	C
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10,000 Pound Gasoline Commercial Cars

A	7850	4000	W. M. Steele, Worcester, Mass.	143	48	8	40	4	5	5	P	C
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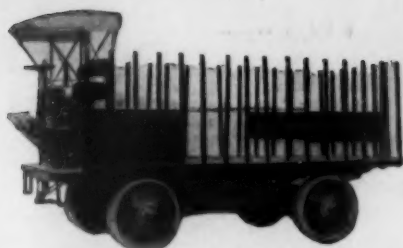
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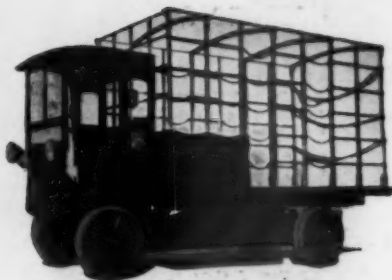
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Couple-Gear Model A, 10,000-lb. Stake, \$5000.



Couple Gear Model A.P., 12,000-lb. Sided Stake, \$4250.



Walker Model E, 6000-lb. Stake.

8000 Pound Electric Commercial Cars

Battery Make	Battery Capacity	Controller Type	Speeds Forward	Drive	Rear Axle	Front Tires	Rear Tires	Steering and Control	% Total Weight on Rear Wheels
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E	375	D	5	C	D	32x5	36x5D	L	71
O	O	D	5	IG	D	O	60

10,000 Pound Electric Commercial Cars

U	350	D	5	SP	D	36x5D	36x5D	R	50
E	450	D	5	C	D	36x6	36x6D	L	70
S	324	..	4	C	D	37x7	37x7D	L	60

12,000 Pound Electric Commercial Cars

U	350	D	5	SP	D	36x5D	66x5S	R	70
E	450	D	5	C	D	36x6	36x7D	L	72

Additions to Eastern Buyers' Review

Radiator	Carburetor	Lubrication	Ignition	Spark-Plug Size	Clutch	Drive	Transmission	Speeds Forward	Front Tires	Rear Tires	Steering Wheel	Brake and Gear Levers	% Total Weight on Rear Wheels	Engine Starter
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2000 Pound Gasoline Commercial Cars

T	Z	SF	E	S	C	C	S	3	36x3 1/2	40x4	R	R	60	..
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4000 Pound Gasoline Commercial Cars

C	SB	SF	E	S	D	C	IC	3	38x5	40x4D	R	R	70	E
T	Z	SF	E	S	C	C	S	3	36x4	36x3 1/2D	R	R	60	..

6000 Pound Gasoline Commercial Cars

C	SB	SF	E	S	D	C	IC	3	38x6	40x5D	R	R	68	E
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8000 Pound Gasoline Commercial Cars

T	Z	SF	E	S	C	C	S	3	36x6	36x5D	R	R	60	..
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10,000 Pound Gasoline Commercial Cars

C	SB	SF	E	S	D	C	IC	3	38x7	40x7D	R	R	70	E
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Couple Gear Model A, 10,000-lb. Stake, \$5000. Also Flareboard, \$5050; Top Type, \$5150.



Witt-Will Model F2-15, 4000-lb. Flareboard, Chassis, \$2250.



Steele Model C, 4000-lb. Flareboard, Chassis, \$2500.



Witt-Will Model E-15, 2000-lb. Canopy Top, Chassis, \$1250.

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* Indicates Price Complete With Body

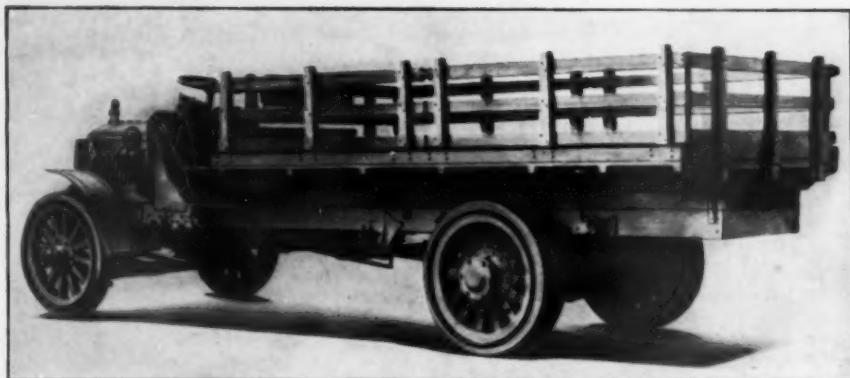
Price	H.P.	Cyl.	Maker.	Page	Price	H.P.	Cyl.	Maker.	Page
500 Pound Commercial Cars					1000 Pound Commercial Cars				
285	11	2	Auburn Motor Chassis Co.	28	1040	20	4	Harvey Motor Truck Works	28
285*	10	4	International Cyclecar & Accessories Co.	28	1040	26	4	D. F. Poyer Co.	28
285*	12	4	Boddy Tool Co.	28	1050	26	4	Jos. W. Moon Buggy Co.	28
425	12	4	Hall Motor Car Co.	28	1050	26	4	D. F. Poyer Co.	28
425*	10	4	Brule Motor Car Co.	28	1050	26	4	Independent Motors Co.	28
525*	12	4	Downing Motor Car Co.	28	1060	20	4	Sandow Truck Co.	28
					1060	27	4	Federal Motor Truck Co.	28
600 Pound Commercial Cars					1060	24	4	Universal Motor Truck Co.	28
255	12	4	Elbert Motor Car Co.	28	1050	27	4	Pacific Metal Products Co.	28
275*	9	2	Harley-Davidson Motor Car Co.	28	1050	27	4	J. C. Wilson Co.	28
750 Pound Commercial Cars					1050	27	4	Kenen Mfg. Co.	28
1040*	Electric.		Connersville Buggy Co.	28	1050	27	4	DeKalb Wagon Co.	28
					1050	23	4	Universal Motor Truck Co.	28
800 Pound Commercial Cars					1050	23	4	J. C. Doyle	28
485	14	2	Auburn Motor Chassis Co.	28	1075	27	4	Service Motor Truck Co.	28
520	17	4	Hupp Motor Car Co.	28	2000	20	4	Universal Motor Truck Co.	28
					2000	27	4	Ideal Auto Co.	28
1000 Pound Commercial Cars					2000	27	4	Kleiber & Co.	28
325*	8	2	Motor Products Co.	28	2000	23	4	Universal Motor Truck Co.	28
330*	21*	2	Homer Motor Co.	28	2000	27	4	Moreland Motor Truck Co.	28
345	21	4	Dart Motor Truck Co.	28	2000	27	4	Kiesel Motor Car Co.	28
350	20	4	Komath Company	28	2100	23	4	Stegman Motor Car Co.	28
390	20	4	Bauer Machine Works Co.	28	2100	23	4	Aetna Motor Truck Co.	28
1040	20	4	H. E. Wilcox Motor Co.	28	2150	26	4	Dandelson Engine Works	28
1200	Electric.		General Motors Truck Co.	28	2200	20	4	Robinson Motor Truck Co.	28
1750	Electric.		American Electric Car Co.	28	2250	24	4	Velle Motor Vehicle Co.	28
1800	Electric.		Waverley Co.	28	2250	27	4	Diamond T Motor Car Co.	28
1850	Electric.		American Electric Car Co.	28	2250	27	4	Detroit-Wyandotte Motor Co.	28
1200 Pound Commercial Cars					2350*	Electric.		J. C. Doyle	28
740	18	2	Auburn Motor Chassis Co.	28	2350	26	4	Crown Commercial Car Co.	28
890	16	2	Durant-Dort Carriage Co.	28	2375	13	3	Mals Motor Truck Co.	28
850	20	4	Dispatch Motor Car Co.	28	2380	13	3	Mals Motor Truck Co.	28
875	20	4	O. K. Motor Truck Co.	28	4000 Pound Commercial Cars				
875*			Sternberg Motor Truck Co.	28	1050	Electric.		General Motors Truck Co.	28
1500 Pound Commercial Cars					1050	27	4	Reo Motor Truck Co.	28
750	16	2	Fargo Motor Car Co.	22	1050	27	4	Dart Motor Truck Co.	28
875	20	4	W. A. Paterson & Co.	22	1050	26	4	South Bend Motor Car Works	28
875	30	4	Commerce Motor Car Co.	22	1060	26	4	General Motors Truck Co.	28
905	20	4	Republic Motor Truck Co.	22	2100	20	4	Wichita Falls Motor Co.	28
1050	23	4	Buser Machine Works Co.	24	2200	32	4	Buckeye Mfg. Co.	28
1075	20	4	Wm. Landshaft & Sons	24	2250	27	4	Anderson Electric Car Co.	28
1085	20	4	Studebaker Corp.	24	2250	27	4	Witt-Will Co.	28
1090	20	4	General Motors Truck Co.	22	2250	27	4	Sandow Truck Co.	28
1125	23	4	Buckeye Mfg. Co.	22	2250	27	4	Palmer-Meyer Motor Car Co.	28
1125	23	4	D. F. Poyer Co.	22	2300	27	4	Mogul Motor Truck Co.	28
1130	23	4	Bulck Motor Co.	22	2300	27	4	Mogul Motor Truck Co.	28
1285	20	4	Independent Motors Co.	22	2500	27	4	Ideal Auto Co.	28
1300	23	4	Thomas B. Jeffery Co.	22	2500	23	4	Pacific Metal Products Co.	28
1500	20	4	Kiesel Motor Car Co.	28	2500	27	4	Service Motor Truck Co.	28
1500	20	4	Denby Motor Truck Co.	22	2500	27	4	H. E. Wilcox Motor Co.	28
1090	23	4	Wisconsin Motor Truck Works	24	2500	27	4	W. M. Steele	28
1090	23	4	Stegman Motor Car Co.	24	2500	27	4	Dorris Motor Car Co.	28
1090	23	4	Kenen Mfg. Co.	22	2500	26	4	Diamond T Motor Car Co.	28
1090	23	4	Wisconsin Motor Truck Works	24	2500	26	4	Avery Co.	28
1090	23	4	Moreland Motor Truck Co.	22	2500	27	4	Duplex Power Car Co.	28
1090	23	4	Dorris Motor Car Co.	22	2500	27	4	Detroit-Wyandotte Motor Co.	28
2080	23	4	Crown Commercial Car Co.	22	2750	23	4	Thomas B. Jeffery Co.	28
2000 Pound Commercial Cars					2800	23	4	Sternberg Motor Truck Co.	28
1250	20	4	Wm. Landshaft & Sons	24	2800	23	4	Packard Motor Car Co.	28
1250	20	4	Fargo Motor Car Co.	22	2850	13	3	Mals Motor Truck Co.	28
1250	20	4	Electric General Motors Truck Co.	28	2850	13	3	Mals Motor Truck Co.	28
1350	23	4	Republic Motor Truck Co.	22	2850	27	4	Service Motor Truck Co.	28
1370	23	4	D. F. Poyer Co.	22	2900	27	4	Aetna Motor Truck Co.	28
1400	20	4	Dart Motor Truck Co.	28	2900	27	4	Kenen Mfg. Co.	28
1400	20	4	Signal Motor Truck Co.	24	2950	27	4	DeKalb Wagon Co.	28
1450	20	4	D. F. Poyer Co.	22	2950	23	4	Moreland Motor Truck Co.	28
1450	23	4	Signal Motor Truck Co.	24	2700	31	4	Dorris Motor Car Co.	28
1500	23	4	S. G. Gay Co.	24	2750	27	4	Kiesel Motor Car Co.	28
1500	23	4	Signal Motor Truck Co.	24	2900	27	4	Stegman Motor Car Co.	28
1550	23	4	Signal Motor Truck Co.	24	2950	23	4	Velle Motor Vehicle Co.	28
1090	20	4	Denby Motor Truck Co.	22	2950	23	4	Lewis Motor Truck Co.	28
1090	23	4	Palmer-Meyer Motor Car Co.	24	3000	20	4	Crown Commercial Car Co.	28
1090	23	4	Wichita Falls Motor Co.	22	3300	15	3	Mals Motor Truck Co.	28
1090	27	4	Avery Co.	24	5000 Pound Commercial Cars				
1700	27	4	Buckeye Mfg. Co.	24	3275	27	4	Service Motor Truck Co.	28
1750	27	4	Ideal Auto Co.	24	3400	31	4	Aetna Motor Truck Co.	28
1850	23	4	Kiesel Motor Car Co.	28	3400	32	4	Kenen Mfg. Co.	28
1850	23	4	Wm. Landshaft & Sons	24	3450	27	4	DeKalb Wagon Co.	28
1925	20	4	National Motor Truck Co.	28	3450	23	4	Moreland Motor Truck Co.	28
2000	27	4	Detroit-Wyandotte Motor Co.	24	3700	31	4	Dorris Motor Car Co.	28
2000	23	4	Diamond T Motor Car Co.	24	3750	27	4	Kleiber & Co.	28
2000	23	4	Service Motor Truck Co.	24	3750	23	4	Kiesel Motor Car Co.	28
2000	27	4	H. E. Wilcox Motor Co.	28	2500	27	4	Stegman Motor Car Co.	28
2000	24	4	Velle Motor Vehicle Co.	28	2950	23	4	Velle Motor Vehicle Co.	28
2000	20	4	Electric American Electric Car Co.	28	2950	23	4	Lewis Motor Truck Co.	28
2150	Electric.		Waverley Co.	28	3000	20	4	Crown Commercial Car Co.	28
2200	26	4	Packard Motor Car Co.	24	3300	15	3	Mals Motor Truck Co.	28
2500 Pound Commercial Cars					6000 Pound Commercial Cars				
1450	Electric.		General Motors Truck Co.	28	1900	26	4	Beck & Son	28
1475	23	4	Republic Motor Truck Co.	22	1900	Electric.		General Motors Truck Co.	28
1500	23	4	Wm. Landshaft & Sons	24	2500*	26	4	Avery Co.	28
1500	23	4	Kalamazoo Motor Vehicle Co.	24	2750	23	4	Standard Motor Truck Co.	28
1800	20	4	Fargo Motor Car Co.	22	2900	27	4	Duplex Power Car Co.	28
1800	27	4	Beck & Son	24	2950	23	4	Standard Motor Truck Co.	28
1850	23	4	Thomas B. Jeffery Co.	22	2975	20	4	Service Motor Truck Co.	28
1700	23	4	Signal Motor Truck Co.	24	3000	23	4	Ware Motor Vehicle Co.	28
1700	23	4	S. G. Gay Co.	24	3000	23	4	Sandow Truck Co.	28
1750	23	4	Signal Motor Truck Co.	24	3000	40	4	W. M. Steele	28
1750	26	4	South Bend Motor Car Works	28	3000	20	4	Harvey Motor Truck Works	28
1800	23	4	Jos. W. Moon Buggy Co.	28	3150	23	4	Pacific Metal Products Co.	28
1800	27	4	J. C. Wilson Co.	28	3300	23	4	Detroit-Wyandotte Motor Co.	28
1900	27	4	Federal Motor Truck Co.	28	3300	26	4	Avery Co.	28
3000 Pound Commercial Cars					3300	26	4	Lewis Motor Truck Co.	28
1450	Electric.		General Motors Truck Co.	28	3350	20	4	H. E. Wilcox Motor Co.	28
1475	23	4	Republic Motor Truck Co.	22	3400	15	3	Mals Motor Truck Co.	28
1500	23	4	Wm. Landshaft & Sons	24	3400	23	4	Packard Motor Car Co.	28
1500	23	4	Kalamazoo Motor Vehicle Co.	24	3400	23	4	Universal Motor Truck Co.	28
1800	20	4	Fargo Motor Car Co.	22	3400	20	4	Sternberg Motor Truck Co.	28
1800	27	4	Beck & Son	24	3500	22	4	Nevada Truck & Tractor Co.	28
1850	23	4	Thomas B. Jeffery Co.	22	3600	23	4	Diamond T Motor Car Co.	28
1700	23	4	Signal Motor Truck Co.	24	4000	36	4	Four Wheel Drive Auto Co.	28
1700	23	4	S. G. Gay Co.	24	7000 Pound Commercial Cars				
1750	23	4	Signal Motor Truck Co.	24	2500	40	4	General Motors Truck Co.	28
1750	26	4	South Bend Motor Car Works	28	3250	36	4	Wichita Falls Motor Co.	24
1800	23	4	Jos. W. Moon Buggy Co.	28					
1800	27	4	J. C. Wilson Co.	28					
1900	27	4	Federal Motor Truck Co.	28					



New Packard Line—Worm Drive—One to Six Tons

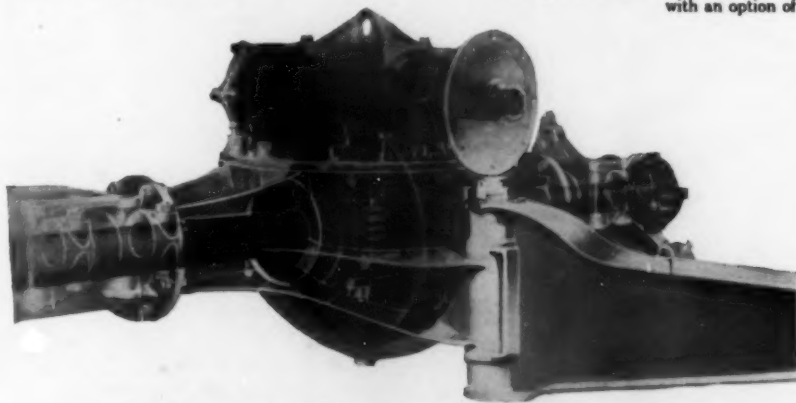
THE announcement of a new line of motor truck models by the Packard Motor Car Company, Detroit, Mich., indicates that company's determination to continue its activity in the heavy duty field and to become exceedingly active in the lighter one-ton field. The new trucks, ranging in capacity from 1 to 6 tons inclusive, give an exceedingly wide range. Each unit is designed particularly to give a maximum result in hauling the load indicated by its rating. The manufacturers believe that the vehicles will operate with the least effort and attention on the part of the driver, as well as minimum expense.

The description given here applies more specifically to the two-, three- and four-ton trucks, which are priced at \$2800, \$3400 and



Three-Quarter Rear View of New Packard Truck

Showing the standard No. 138 stake body. The removable gates come in three heights, with an option of two, three or four slats



Phantom View Disclosing Mechanism of Packard Rear Axle

The worm, which is above the worm wheel and differential, is mounted as a unit in a steel carrier, which is bolted in place in the center housing of the axle. This construction permits of quick and easy assembling or disassembling of the worm, worm wheel and differential, which may be removed without disturbing the road wheels or taking the axle from under the truck.

tor connections the entire unit may be displaced without hoisting.

An especially desirable feature of the motor design is found in the compound piston rings. The two lower grooves in the pistons are fitted with four rings each, while the upper groove has a single ring. This construction has proven a very adequate guard against leakages. The drop-forged heat-treated crank shaft is mounted in four babbitt-lined bearings, carried in bronze backings in the upper section of the crank case.

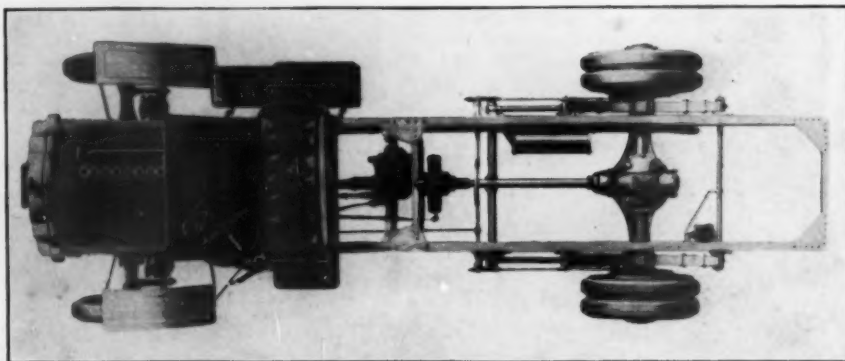
The improved carburetor is exclusively Packard in design and manufacture. The air intakes are equipped with shut-offs to facilitate starting in cold weather. The unit is also carefully protected from mud and water and hot-water jacketed. The design combines a float feed, a large cylindrical mixing chamber directly above the aspirating nozzle and automatic regulation for all motor speeds. The fuel mixture is

\$3800 respectively. Provision is made for the attachment of a power take-off at a moderate cost.

Motor

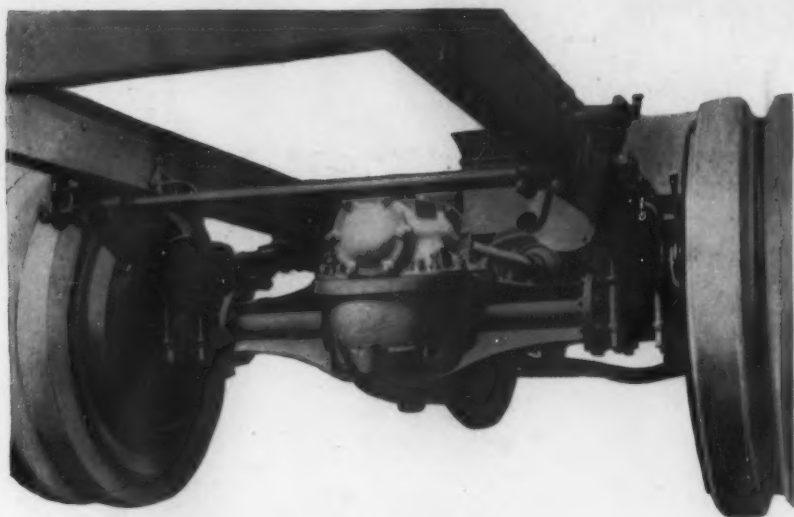
The motors of the new line are of the four-cylinder L-head, water-cooled type. The cylinders are cast en bloc. The power units are mounted under the bonnet on the front end of the frame and suspended at three points as a protection against frame weave. The two-ton motor is rated at 25 h.p., while the three-ton and four-ton motors are rated at 32 h.p.

Experienced truck operators will appreciate the provision made for repairs on the motor. By removing the radiator and front bumper and detaching the intervening mo-



Plan View of New Packard Truck Design

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

**Packard Rear Axle**

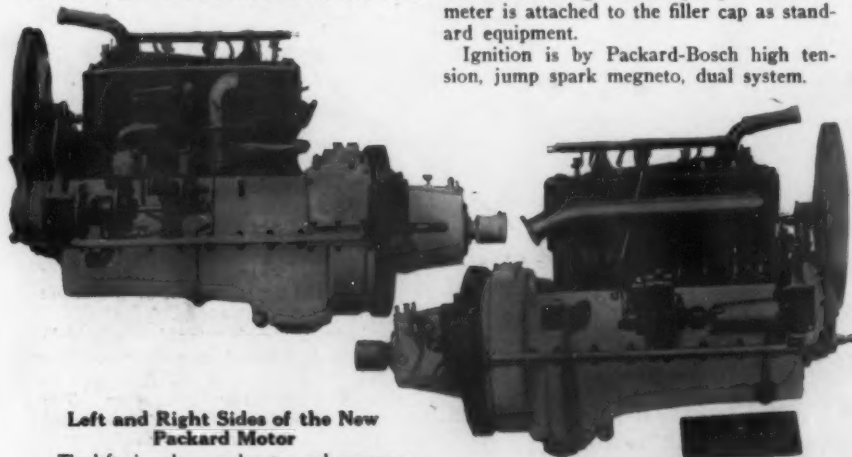
A sturdy steel structure reinforced by massive webs, which are integral with the housing. The lower part of the axle housing forms an oil reservoir, with an oil level and filler plug which automatically prevents overfilling. The rear springs are mounted on seats trunnioned on the axle housing in order to prevent their absorption of the driving and braking strains.

controlled from the control box on the steering column.

The lubricating system is simple but effective. A gear pump in the lower half of the crank case, driven from the cam

The radiator is of the cellular, honey-comb type, supported and cushioned by springs on the frame side members. A positive circulation is insured by a gear-driven centrifugal water pump. A Moto-meter is attached to the filler cap as standard equipment.

Ignition is by Packard-Bosch high tension, jump spark magneto, dual system.

**Left and Right Sides of the New Packard Motor**

The left view shows carburetor and governor, both being entirely automatic in their action. The carburetor is of exclusive Packard design and manufacture. The governor is enclosed and sealed to prevent tampering and acts on an independent throttle in the carburetor. At speeds below the limit permitted, the motor is controlled by a secondary throttle actuated either by an accelerator pedal or hand lever on the control board.

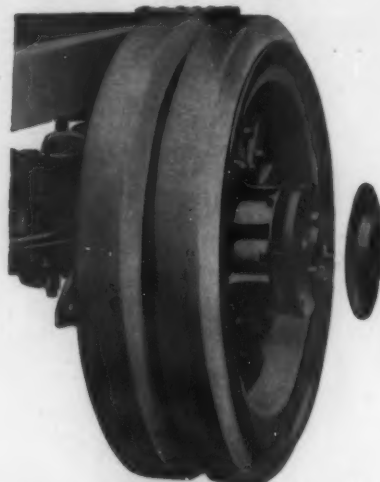
On the right side is mounted the Packard-Bosch duplex high-tension magneto. The motor is of four-cylinder, L-head, cast en bloc type. Valves are tungsten steel.

shaft by a spiral gear, supplies oil under pressure to all motor bearings. The pistons and cylinder walls are lubricated by overflow from the piston-pin bearings and by spray from the lower connecting rod bearings. The helical front gears are lubricated by overflow from an oil screen and by-pass at the front of the motor. A gage on the dash shows the exact pressure at all times.

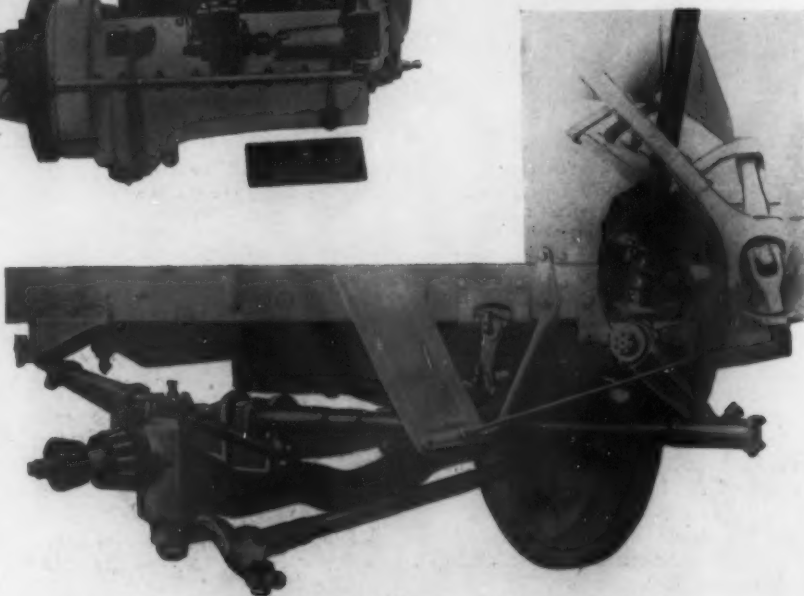
The automatic governor provides for an option of speed, varying with the model. A lever on the central control operates the automatically controlled throttle within the speed previously determined by the owner. The entire mechanism is enclosed and sealed.

Drive

In the clutch design the well-known Packard dry-plate principle is used.

**Rear Wheel of New Packard Truck, With Hub Cap Off**

The differential ends of the Packard axles contain six integral splines, closely fitted into keyways in the differential gear hubs. Forged integral with the exterior ends of the axle shafts are large flanges with four tongues. These tongues engage, with a few thousandths clearance, corresponding slots in steel plates which are keyed and bolted to flanges on the outer ends of the wheel hubs. This design permits relative motion between the wheels and driving shafts, so that play in the wheel bearings cannot cause breakage of the shafts due to bending.

**Steering Connections and Gear of New Packard Truck**

The steering gear is of the worm and sector type. Both worm and sector are forged integral with their respective shafts. Adjustments may be made without removing the steering assembly from the frame.

The CCJ has most readers because it gives most information

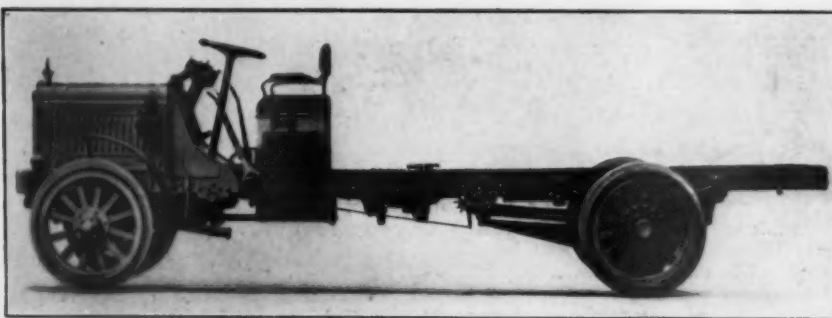
The transmission is supported at three points by two pressed-steel cross-members. Power from the transmission is conveyed to the worm shaft in the final drive through a shaft and two substantially enclosed grease-packed, oil-tight universal joints.

Worm Rear Axle

The Packard final drive is incorporated in a built-up rear axle. The weight of the truck is carried on heavy steel tubes which are hydraulically pressed into a rigid, central housing. The worm, worm wheel and differential are mounted as a unit in a steel carrier which is bolted in place in the center housing of the axle. The worm is mounted above the wheel. The lower part of the axle housing forms an oil reservoir, equipped with an oil level and filler plug which automatically prevent over filling. The worm, worm wheel and thrust bearings are provided with a constant lubrication.

Tubular radius rods of great strength remove all the driving strains from the springs. A steel torque arm is hinged to the front of the worm housing and the front end of the arm is supported by a tubular cross member.

A feature of the Packard worm drive lies in the fact that it permits a quick and easy disassembling of the worm, worm wheel and differential, and their removal without



Left-Side Chassis View of New Packard Truck

disturbing the road wheels or taking the axle from beneath the truck.

Other Details

The springs are semi-elliptic, front and rear. There are two sets of brakes, emergency and service, the service brakes being sufficiently powerful under normal conditions to lock the wheels.

The steering gear is of the worm and sector type. Worm and sector are forged integral with their respective shafts and the steering connections, customary to the company's policy, provide absolute safety. All levers have been removed from the steering wheel to the central control board.

mounted directly in front of the steering column.

The front axle construction is of the drop-forged, I-beam type, and of extra large cross section. The frame is of channel section rolled steel.

The wheel specifications provide for single, solid tires in front and dual solid on the rear. The wheels are of the heavy, wooden artillery type.

The new models are furnished in standard and long wheelbase lengths. The two-ton model comes in 144 and 168 in. wheelbases, and the three- to four-ton models in 156 and 162 in. wheelbases.

The Mack One and Two-Ton Worm Drive Trucks



TWO new models announced by the International Motor Company, New York City, are the Mack one and two-ton worm driven trucks.

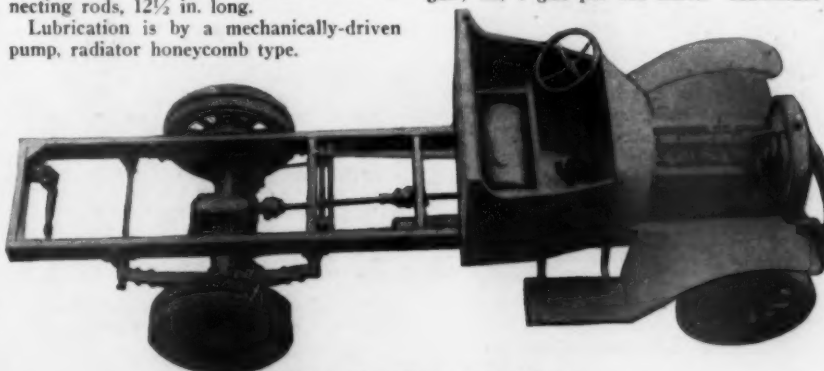
The motors on both models are identical, being four-cycle, four-cylinder type, cylinders cast in pairs, 4-in. bore, 5-in. stroke; 26.6 S. A. E. h.p. Crank case is aluminum, lower half removable without disturbing the main bearings. A sealed governor is enclosed; flywheel also enclosed and gear box attached to housing. There are only three motor gears. The inlet manifold is water-jacketed, and exhaust manifold is double.

Valves are enclosed, and oiled by breathers. Pistons are removable through bottom of crank case, crank-shaft bearings 3 in., connecting rods, 12½ in. long.

Lubrication is by a mechanically-driven pump, radiator honeycomb type.

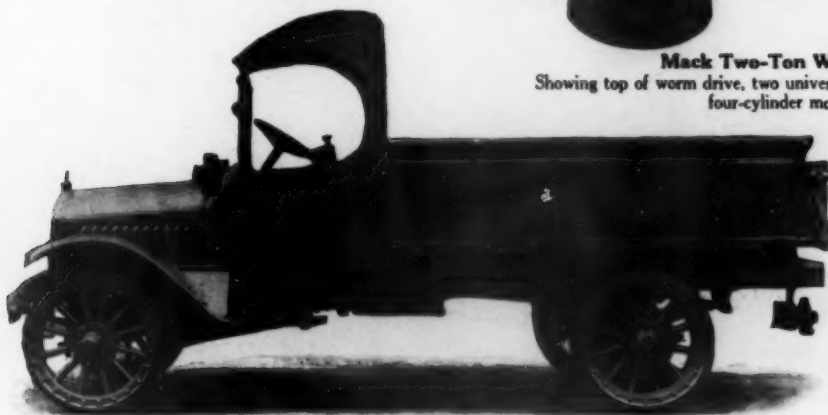
One-Ton Model

Fuel consumption about 9-10 miles per gal.; oil, 1 gal. per 180 miles. Maximum



Mack Two-Ton Worm-Drive Chassis

Showing top of worm drive, two universal joints, left-side drive, center control, four-cylinder motor and dual tires



Mack Two-Ton Worm-Drive Flare Board

Side view of the chassis fitted with a standard body; showing front fenders, step, driver's cab and other details

speed, 18.4 m.p.h., three-speed transmission on taper roller bearings, bevel gear differential with nickel steel gears, dry plate clutch with six plates lined on both sides, operating against six thin plates, internal and external brake on brake drum, 15½ in. in diameter, foot brake outside and emergency brake inside, worm, wheel and shaft-type steering gear, semielliptic springs front and rear.

Front axle is drop forged, I-beam, hubs fitted with taper-roller bearings. Final drive is through a worm and gear, rear axle of full-floating type, wheel and spring load being taken entirely on the casing. Drive is taken through springs.

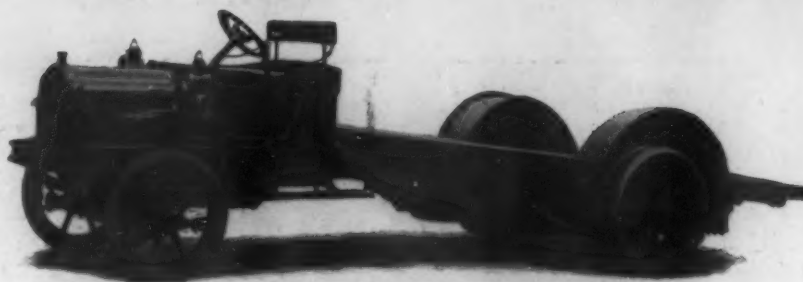
The CCJ has most advertisers because it gives them biggest returns

Wheels are fitted with 36x4 in. single tires in front, 36x3½ in. dual, or 36x6 in. single in rear. Wheelbase is either 132 or 144 in., with 58½ in. tread. Long wheelbase will turn in 25 ft. radius, short wheelbase in 22 ft. radius.

Price, including metal seat, sliding door, tool equipment, etc., is \$2000.

Two-Ton Model

On this model the brake drums are 16¼ in. in diameter, front tires 36x4 in., rear tires 36x4 in. dual. Wheelbase, 144 or 162 in. Price, \$2700. In other respects the chassis specifications are the same as for the one-ton model.



White Five-Ton Underlung Chassis
Giving a platform for extra low loading height

B. A. Gramm's Five-Ton Trucks

This is one of the latest models marketed by the Gramm-Bernstein Company, of Lima, Ohio. It gives a very complete line of types and capacities, so that the truck best suited to any conditions may be obtained.

This unit is a Continental product, six cylinders, 4½x5¼ in., cylinders in threes, enclosed valves, centrifugal pump circulation of cooling water, combined circulation and splash lubrication. Fly ball governor limits speed to 1000 r.p.m. Cellular radiator on springs.

Clutch and Transmission

A dry plate disc clutch is mounted in the flywheel. The individual clutch transmission with four forward speeds and one reverse is used. The gears have 1¼ in.

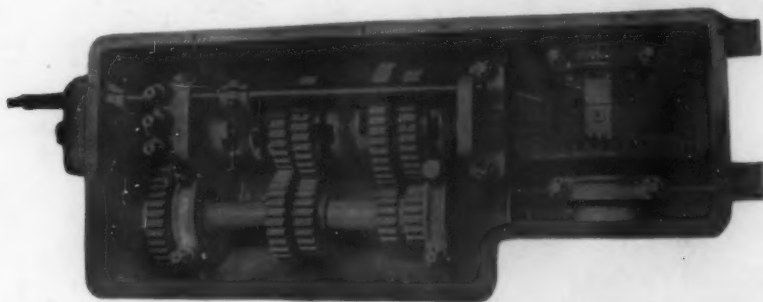


B. A. Gramm's Five-Ton Chassis
The increased length of the motor has caused its disposition under the hood in front.
Note the heavy 9 in. frame

face. The starter is mounted in the transmission. Ball bearings throughout.

Drive

Two universals are employed on the propeller shaft. Jack shaft is floating type with 1¼-in. pitch roller chain final drive. Rear axle is 2¾x4¾ rectangular, drop forge high carbon steel. Radius rods are



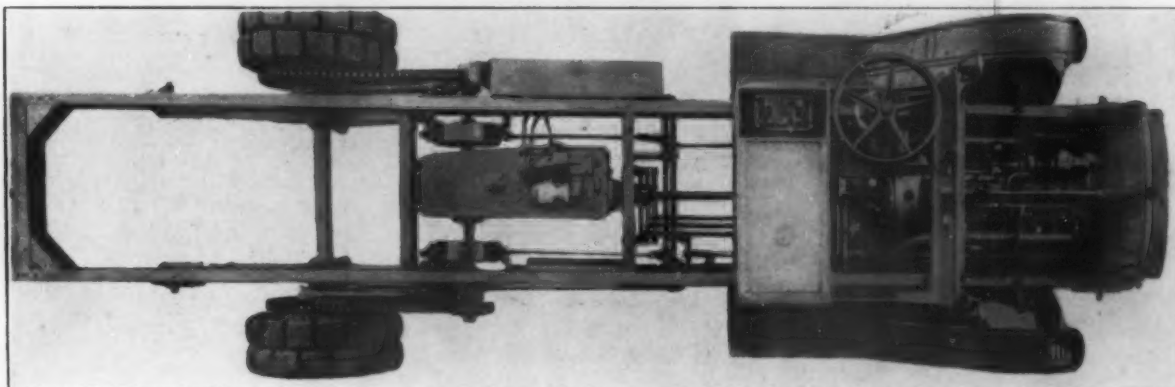
B. A. Gramm's Transmission
Showing the individual clutches, which permit the gears to be constantly in mesh.
Radial ball bearings on the gears and shafts. Shaft has six splines

centered on both jack shaft and rear axle with universal joints.

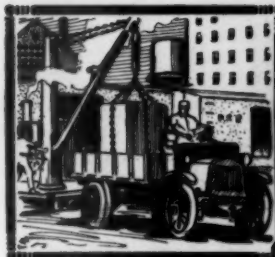
Other Details

Springs are electro-silico manganese steel, semielliptic, 48x3½ in. front and 60x4 in. underslung rear, with ends sliding on hardened steel plates. Service brakes are 13¾x2½ in., external, on the jack shaft; emergency are 20x4 in., internal, on rear wheels. Steering gear is worm and nut. Standard body length is 162 in. and 66 in. width. Chassis price is \$4500. Wheelbase is 168 in., tread 70 in. front and 72 in. rear.

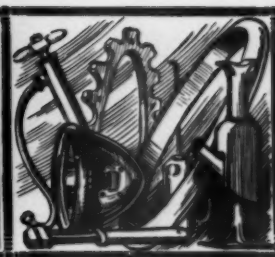
Equipment includes electric starter, hub odometer, two electric head lights, electric tail lamp, electric extension lamp, electric horn, governor, full set of tools and jack.



Plan of B. A. Gramm's Five-Tonner
Showing location of units, sturdy proportions, electric starter and lighter mounted in transmission, etc.
The CCJ leads in circulation, advertising and prestige



TRUCK ACCESSORIES AND APPLIANCES



EASYON TRUCK CHAINS

The Easyon Truck Chains are intended for use on solid tires. They are similar to those for pneumatic tires described in these columns in our November issue; are made of heavier material and the cross chains are made of twisted welded chain in place of the stampings. They can be applied in a moment without jacking-up the wheel, even when stuck in the mud.



The Easyon Truck Chain

The fastener is a very strong strap which goes across the rim and has snaps at each end. This strap has a long leather loop on it which passes around the spoke to hold the chain in place.

The cross chains are adjusted on the tire by snapping into the different links according to the length of the chain that is necessary.

The chains are packed with a set of eight in a bag, suitable for carrying in the car. They are made in three sizes: small size, which fits tires up to 3½ in., costs \$4 per set, or 50 cents each; medium size, which fits tires up to 50 in., costs \$6 per set, or 75 cents each, and the large size fits dual tires, and costs \$8 per set, or \$1 each. They are made by the Leather Tire Goods Company, Niagara Falls, N. Y.

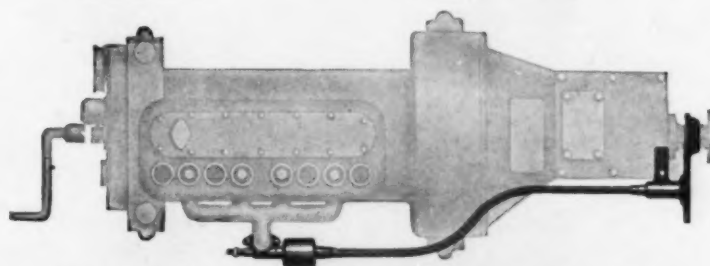
NEW TRANSMISSION-DRIVEN PIERCE SPEED CONTROLLER

The Pierce Speed Controller Company, Anderson, Ind., is placing on the market a new type of speed controller which has many advantages over its old type of controller, driven from the front wheel. This model "G" controller is driven from the propeller shaft at the rear end of the transmission, and can be used on any make of car. The method of application is very simple, the controller being placed between the intake manifold and the carburetor, the valve box containing an auxiliary butterfly valve which is operated by centrifugal force from the controller itself.

The controller is driven by a flexible shaft contained in a flexible housing, from a pair of spur gears. These gears have a ratio of two to one, so that the controller operates at one-half motor speed. This controller is not graduated to a certain number of miles per hour, as is this company's wheel-driven controller, but is adjusted by a small adjusting screw, and may be set with the speedometer at any desired speed.

This controller is furnished complete with driving gears and flexible shafting. The gear which attaches to the propeller shaft, or flange of the propeller shaft, is a split gear, so that it is easily installed without the removal of any of the parts.

This controller serves to control the speed of the car to miles per hour, or, rather, vehicle speed only, and does not interfere with the power of the motor in any respect, being entirely independent of the number of revolutions made by the motor, and does not operate until the car itself attains the limited speed. It is especially adapted for use on light trucks, fire apparatus, taxicabs, ambulances, patrol wagons, etc., where a speed of a certain number of miles per hour is desired, and not a limit of speed on the motor.



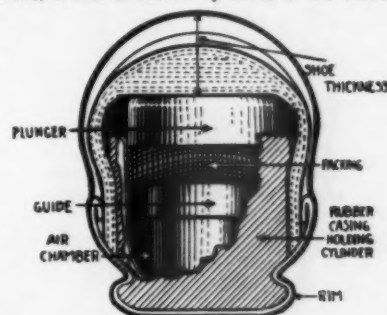
Showing Application of New Transmission-Driven Pierce Speed Controller, Model G

This controller is an improvement over the Pierce Speed Controller Company's popular front-wheel driven controller, and does away with the dissatisfaction caused by driving gears. The new arrangement controls only the vehicle speed, irrespective of the number of revolutions per minute made by the motor.

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?

THE STEEL PNEUMATIC TIRE

The Steel Pneumatic Tire Company, 21 W. Sixty-second Street, New York City, is manufacturing a new tire which is claimed to be proof against punctures, blow-outs, rim cuts, etc. It is suitable for trucks up to 4 tons, and is claimed to give three times the mileage of a regular casing. This is accounted for by the thickness of the shoe, which is extremely thick at the tread.



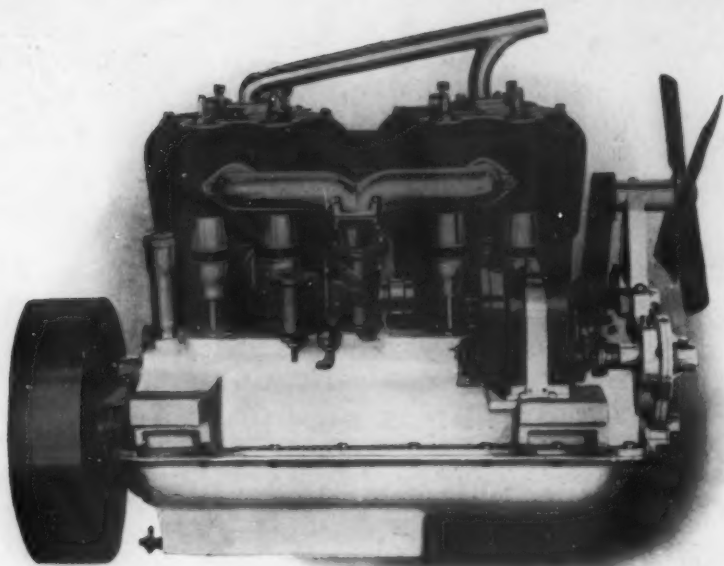
Section of Steel Pneumatic Tire

Instead of using the customary inner tube, a series of steel cylinders is made use of in which a fixed air pressure is automatically maintained by the movement of the wheel on the road. A plunger or piston in each cylinder pumps air into the cylinder. When the wheel strikes an obstruction, the air pressure is increased and this absorbs the force of the blow. This tire is made in seven sizes from 32x3½ to 37x5 in. Prices range from \$27 to \$55, which includes attaching of the tire to wheel.

WISCONSIN, MODEL J. FOUR-CYLINDER TRUCK MOTOR

This is the latest offering of the Wisconsin Motor Manufacturing Company, of Milwaukee, Wis., and for which no radical claims are made, and in which standard practice is strictly adhered to. All parts are made to jigs and are interchangeable, while the workmanship is of the most accurate. The gears are cut on an imported hobbing machine, and are said to be absolutely noiseless. All studs and bolts are S. A. E. standard. The large bolts have castle nuts, while the smaller have lock washers.

Brief details of the motor are as follows: Cylinder cast in pairs, inlet and exhaust valves on opposite sides. The cylinder and valve passages are entirely water-jacketed. The valve chamber, water-jacket and cylinder heads are cast integral. The piston rings are semi-steel, eccentric turned in lathe and then ground. The wrist pin is of hollow tool steel ingeniously fastened to



Intake Side of the Type "J" Wisconsin Truck Motor

Four cylinders, $5\frac{1}{8}$ in. bore, $5\frac{1}{2}$ in. stroke; valves interchangeable, on opposite sides; all bolts and studs are S. A. E. standard; furnished with Pierce Speed Governor if desired

the connecting rod by a bolt, giving larger bearing surface. Chrome nickel-steel crank shaft. Cam shaft is 40 per cent. carbon steel forging, running in large, bronze bearings. Push rod is of tool steel, guided by phosphor bronze guides, which are fastened to crank case by studs and lock washers. Push rods and valve springs are entirely enclosed by an aluminum housing which is split in the center, and is held in place by a spring and can be readily removed.

The crank case is of aluminum and is very light, the upper half holding the bearings. The lower half is fitted with an oil reservoir. Either $17\frac{3}{4}$ in. by 3 in. or 27 in. by 5 in. supporting arms can be furnished. Lubrication is by means of a gear pump located on the outside of the lower crank case and driven by spiral gears from the cam shaft. A float and ball type gage indicates the exact amount of oil in the reservoir. Distinct marks on the glass show the high and low mark, and if oil is maintained between these two levels, no burnt oil is emitted, while danger of cutting the bearings is eliminated. Main and connecting-rod bearings are of babbitt-lined bronze and grooved, all others of phosphor bronze. Valve springs are of large diameter.

SENTINEL PYROMETERS AND PASTES AND THEIR USES

A new method for measuring temperatures wherever heat is applied has just been developed by the Carl Nehls Alloy Company, of Detroit, Mich. This consists of different kinds of metallic salts, which are made into molecular mixtures that will melt down at different temperatures throughout the range between 220 and 1330 degrees centigrade. Practical means have been devised for using them in place of the more costly pyrometers. They are also very useful for checking pyrometers. A cylinder is

placed at the end of the thermo-couple and when it melts, the pyrometer should read the same as the temperature marked on the "sentinel."

One way is to cast them in solid cylinders, as shown by those standing on end in the accompanying illustration. Each one is wrapped in a paper on which is printed its correct melting temperatures in degrees centigrade. For all temperature below 932



Sentinel Pyrometer Pastes

Of different melting points for determining temperature between 220 and 1330 degrees centigrade.

degrees, F. these "Sentinel Pyrometers" can be used in an air-tight glass tube. The salts can then be used over and over again. By using the small porcelain saucers shown, the salts do not run to waste and litter up the place where they are used. This also enables them to be used several times, as the salt melts each time the temperature raises above the one marked on the cylinder and becomes solid again the moment the temperature falls below this degree.

These salts are also made up in the form of a paste. Enough to make several hundred determinations is packed in each tin. Pastes with various melting temperatures can be daubed along a steel bar, as shown in the front of the picture, and inserted into furnaces, ovens, retorts, flues, gas mains steam pipes, etc., to find the temperature at which they are operating. The

salts that melt down and those that remain solid will indicate the temperature, which would be between the two. By using a long bar one can determine whether the temperature is uniform in the front and back, top and bottom or corners, or a furnace, oven, kiln, etc.

THE SHAKESPEARE AUTOMATIC CARBURETOR

This new carburetor is the product of the William Shakespeare, Jr., Company, Kalamazoo, Mich. By means of a single mechanical unit—the Schmidt automatic valve—this carburetor automatically takes care of all engine speeds with equal efficiency and economy. This is the only moving part of the carburetor outside of the float mechanism.

The primary air inlet and gasoline nozzle are in the center of this valve, and additional air is admitted around its periphery.

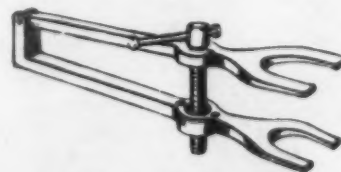


Sectional View of the Shakespeare Automatic Carburetor

This view shows the Schmid automatic valve which is a combination throttle and air valve and is the only moving part of the carburetor.

Only one single adjustment is made in which once set requires no readjustment, winter or summer, at any altitude.

The gasoline inlet to the float chamber is also unique in construction, as will be noted from the illustration. This carburetor is made in four sizes: $\frac{3}{4}$ in., \$12; 1 in., \$15; $1\frac{1}{4}$ in., \$16.50; $1\frac{1}{2}$ in., \$19.50. Dash control, \$1.50; starting and temperature control connection, \$1.50.



"C. P." Improved Valve Lifter

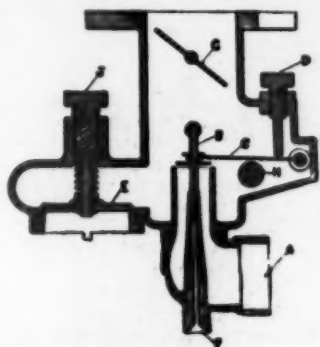
Made by the Clinton Machine Works, 460 High Street, Clinton, Mass. It works like a vise, holds the spring rigid and enables the operator to work with both hands. It can be used on any car. The nut in the lower fork oscillates to prevent binding of the thread. Price is \$1. This company also makes a very simple and effective cotter pin puller. Price, \$25.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

THE M. F. FLOATLESS CARBURETOR

A glance at the sectional view shown herewith reveals the fact that this carburetor does not contain a float, but is directly connected with gasoline line at the opening F. From here the gasoline passes the needle B with the suction caused by the motor. The amount of gasoline passing the needle is regulated by the spring C, the latter being held under adjustment by the thumb screw D. Hot air is taken in through a flexible tubing at the opening A and is mixed with the raw gasoline at the needle valve. For cold weather starting the cam H is temporarily turned to lift the needle from its seat, allowing the raw gasoline to flood in. With self-starters, this operation is made from the dash at the moment of actuating the starter. For hand cranking a wire is run to the front of the radiator.

The auxiliary air intake is shown at E. Adjusted at the time of installation of the



Sectional View of the M. F. Floatless Carburetor

carburetor this will automatically work thereafter. For high-speed work, special adjustment is made by the thumb screw J. G is the usual butterfly valve.

Prices are as follows: 1 in., \$12; 1 1/4 in., \$14; 1 1/2 in., \$16. Made by the Floatless Carburetor Company, 102-4 Jefferson Avenue, Brooklyn, N. Y.

THE FRITZ CARBURETOR

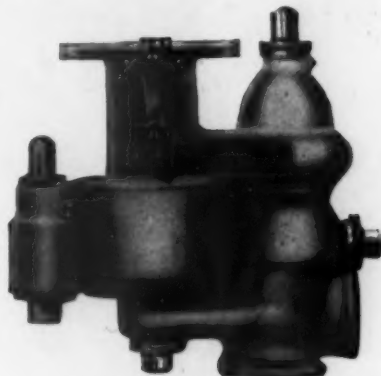
This carburetor is the product of the Fritz Carburetor Company, Norristown, Pa.

By referring to the sectional illustration, the action can be very readily understood. The primary air is drawn through the restricted passage A and is centered by means of a supplementary air jet B to draw the gasoline through jet C. This device acts as an atomizer, thoroughly diffusing the liquid into a mist. The proper amount of fuel to obtain a smooth, low-throttled engine is adjusted by the knurled, self-locking needle D. Upon opening the throttle E about one-quarter way, the air valve F raises sufficiently to admit the necessary air. The valve is adjusted by the knurled, self-locking adjustment G.

For high speed, hill climbing and quick pick up, additional gasoline is obtained by turning the self-locking adjustment nut H. The necessary air for high speed and hill-climbing is automatically self-adjusting as follows: when the air valve F reaches its limit of necessary lift, the valve presses up-

ward against the needle, lifting this needle from its seat, and its tapered construction automatically proportions the additional gasoline.

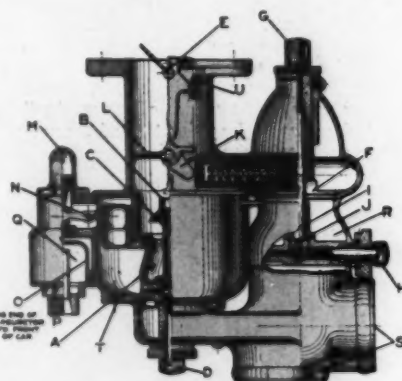
This carburetor employs an ingenious device to supply a richer mixture for starting, this being obtained through an auxiliary jet controlled by a lever and the valve L. This lever is conveniently located on the dash or may project through the radiator. When in this position a port-hole in the valve rod completes a passage for the gasoline to be drawn from the flood



Side View of Fritz Carburetor

chamber into the intake manifold, nearly all air being restricted by this automatic starting valve L. As soon as motor is started this valve automatically admits air, reducing the richness only enough to prevent "flooding" the cylinders. Low grade gasoline will not flood in a Fritz carburetor after switching off the spark, due to the use of a special high jet, a part of atomizer B.

Extraordinary precautions are taken to prevent foreign matter entering the work-



Cut-Away Section of Fritz Carburetor

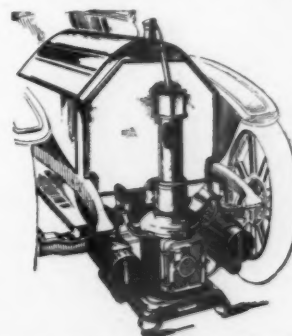
A, main and low-speed venturi; B, main air jet; C, main and low-speed fuel jet; D, main and low-speed adjustment (automatic lock); E, throttle; F, intermediate air valve; G, intermediate air-valve adjustment (automatic lock); H, high-speed and hill adjustment (automatic lock); I, high-speed automatic fuel valve; J, high-speed fuel jet; K, cold-weather priming lever; L, priming-valve governor; M, float needle valve (lifts out freely for inspection); N, float (metal); O, fuel screen (removable for cleaning); P, screen plug fuel connection; Q, sediment trap; R, auxiliary air venturi; S, hot-air tube connections; T, drain cock; U, throttle adjustment.

ing parts of this carburetor. The screen O is very large and has an extremely fine wire mesh. This screen is separate from the valve seat and all gasoline must pass through it before entering the carburetor. The screen can be removed by unscrewing the plug P without disturbing the carburetor in any way. The stand pipe Q allows a great deal of foreign matter to collect before completely shutting off the screen. The cap M, when unscrewed, permits the needle valve being taken from the seat N to remove any foreign matter that might by any unusual means escape the filtering screen.

The 1 1/4 in. size lists at \$25; 1 1/2 in., \$35; 1 3/4 in., \$40, and 2 in., \$45. Hot air attachments are \$2.50 for all sizes. This price includes 3 ft. of flexible tubing. Greater length is extra at \$.25, \$.30, \$.45 and \$.50 per ft. for the four sizes.

NEVEROUT RADIATOR AND GARAGE HEATER

This device is built to take the place of an expensive heating plant, and will burn from 36 to 48 hours with one filling of kerosene, according to the size of the flame. The heater has a capacity of 2 gallons; the tanks being divided so that each holds one gallon. They are conveniently placed, one on either side of the heater in order to balance same, and if the heater is required only a short time, it is necessary to fill one tank only. By means of mixing air with the flame, the heat is brought to sufficient intensity so that carbonizing is avoided. The flame is thoroughly protected by a screen preventing danger from fire.



Neverout Radiator and Garage Heater

This heater keeps the cooling water at a proper temperature and also heats the garage, similarly to an oil stove, but without danger.

The method of operation is simple, water being taken from the lower part of the radiator through a drain cock, passing through copper coil above the flame, whence it is returned through the water filler tube of the radiator. This outfit is recommended for commercial car use, especially as many trucks are kept in cold stables or barns over night, and in order to prevent freezing, draining the water from the circulating system is frequently resorted to.

This device is manufactured by the Rose Manufacturing Company, 910 Arch Street, Philadelphia, Pa.

The CCJ has most readers because it gives most information



THE FLOTSAM AND JETSAM OF WAR—DERELICT-RESCUING IN FRANCE

By OUR FOREIGN CORRESPONDENT

GIGANTIC as the losses will be among the ranks of automobiles in Europe, before the war is concluded, much is being done to counteract these losses. In the retreat of the French and British armies after the battles at Charleroi, Mons, and the many other fields where the only partly prepared Allies were driven back before the overpowering weight of Germany's attack, hundreds of British and French transport vehicles of all sorts were left in the hands of the Germans; after the battle of the Marne the Germans left such spoils to the Allies. The debris left behind by even victorious armies is enormous, and when hosts are in retreat it is incalculably greater.

Consequently, ever since these titanic engagements, hundreds of wounded motor vehicles have been lying in obscure villages and along lanes and even main roads throughout northern France and Belgium. There is every evidence to show that the Germans have collected a great number of these machines that fell into their hands, and are already using many for transport, and the Allies are doing the same.

The Etiquette of Collectors

The British first took up the work, using a branch of their army service corps, and when the French saw the possibilities, they were not slow to follow suit. An amusing rivalry now exists among the collectors, who observe a sort of formal etiquette to which both French and British adhere. All French cars that are saved are returned to the French military authorities; all British vehicles are handed back to their owners, the remaining German machines affording the object of competition.

All local authorities have been instructed to report the presence of any broken-down cars or wagons in their district to the nearest military authorities.

The Salvage System

As soon as broken-down cars are reported, officers lose no time in sending out to investigate before the other side gets on the track. On reaching the derelict a hasty examination is made to decide if it can be repaired sufficiently to be moved under its own power, if horses will have to be requisitioned, whether parts of it can be used, or whether it is absolutely worthless. If horses are wanted, local mayors have instructions to commandeer them for the purposes. The work is most interesting, and some valuable finds are made. Sometimes

only a slight repair or replacement is necessary to get the car running again; often it is only a wheel that is required, or some repair that can be done on the spot. The lighter vehicles, such as private cars and motor cabs, are often loaded bodily on to motor trucks and taken away.

Even if the machine is not worth saving as a whole, it is seldom that it fails to yield something of value in the shape of parts.

Incidentally, motor salvage work has its pathetic side, for it often takes one into the most out-of-the-way places, and those carrying out the work also take the opportunity of making a careful note of all the unknown graves they come across in the course of their duty, this with the view to reporting to the Red Cross Commission, now at work over the whole countryside, to obtain trace of the dead and missing.

Crossing the Breeds

After being requisitioned the cars are sent for repair to various centers. Rouen is the headquarters for repair or re-assembly into some composite make of vehicle. Indeed, the fitting of a gear box from one derelict, a radiator from another, and so forth, to the frame of a third, has produced some most extraordinary crosses.

There is one potentiality of the impressed war motor that has not yet been realized. Many of the British firms, whose cars were impressed, are large undertakings with export business. War broke out so suddenly that there was no time to prepare these vehicles for service; they had to go out just as they were, and by now, thanks to these motors, the names of many big British firms are a household word throughout the north of France. The firms may have temporarily lost the services of some of their transport, but they have had a fine advertisement, and it will be their own fault if they do not take full advantage of the situation when peace comes. However, advertisements like this cannot last forever, and before the trucks come out again after their rescue they are treated to a coat of less showy, but probably more serviceable, battleship gray.

WHO SHALL SELL THE TRUCK?

The attention that the methods of commercial car sale has been receiving at the hands of the British motor trade is, as I foretold last month, continuing to attract attention, and just before Christmas it formed the subject of a debate of the Motor Trades Debating Society. It was, however, difficult to divest one's self of the impression that many of the speakers (some of whom were equipped with rather an inadequate knowledge of their subject) were taking the view that they wished to face rather than the view that had to be faced.

As it was, the resolution that "the sale of commercial motor vehicles of all kinds can best be effected through accredited pleasure vehicle agents" was carried by a large majority, though it is generally recognized over here by responsible people that each case will have to be treated on its merits, and that orders coming from Government departments or business people for three hundred, thirty, or even three trucks at a time cannot be regarded in the same light as the order of the wealthy private owner for a single private car, nor can the same business method be employed. The business man who can place a wholesale order will not pay away to the dealer some hundreds of dollars commission so long as he can easily avoid it, and he always can easily avoid it, for if any manufacturer refuses to deal with him direct, he can place his order elsewhere, and the manufacturer knows it.

It was further suggested that the ordinary dealer is not at present suitably equipped, either financially, by experience, or in the garage, for the handling of heavy commercial vehicles, though the light delivery van offers a proposition similar enough to the private car to be practicable. In some cases, however, it was suggested that some of the larger dealers could take up the heavy commercial automobile, provided a separate department was instituted for the purpose.

While the general feeling was undoubtedly in favor of giving the dealer every chance as an apostle of the commercial car and a distributor, there is a very general feeling—and one well founded—that the dealer has hitherto not done his part in encouraging the use of the business automobile, and, that broadly speaking, it is scarcely fair for him to come in and reap the profits that will undoubtedly be won by those who have borne the burden and heat of the day.

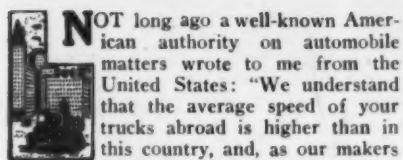
NEW FUEL WITH AN ALCOHOL BASIS

From South Africa come reports of a new motor fuel known as Natalite, the basis of which appears to be a denatured alcohol, since it is stated that it can be produced at \$.09 in any country where alcohol-producing crops can be advantageously cultivated. Some tests also go to show that the fuel is soluble in water, which incidentally means a real advantage, in that a drop of water in the fuel tank will not choke the carburetor, as with gasoline. An engineer, who tested it, reported that this fuel gave off distinctly more power than alcohol, volume for volume, and that no visible engine corrosion resulted from its use. The fuel is now being submitted to extensive scientific tests.

The CCJ has most advertisers because it gives them biggest returns

Economical Speed—A Study of European Conditions

Roads Are the Decisive Factor—Conditions Vary so That it is Impossible to Assume Hard and Fast Speed Laws



NOT long ago a well-known American authority on automobile matters wrote to me from the United States: "We understand that the average speed of your trucks abroad is higher than in this country, and, as our makers think they drive too fast already in this country, we would like to know how you get over it in England." Let me give the plain facts, not in England only but in Europe, and leave Americans, who best know the conditions in their own land, to compare the two and judge for themselves.

On the Continent the conditions vary so that it is impossible to assume any hard and fast speed laws, but broadly speaking one may take the Swiss regulations as typical. Under these for "camions" and "lastwagen" for loads up to 6 tons a speed of 15 kilometres (9.32 miles) an hour is allowed, while the bigger vehicles are only allowed 12 kilometres (6.84 miles) an hour; 20 kilometres (12.43 miles) an hour is the maximum for omnibuses. The speed of private cars (and with them light delivery vans and carriers may be included) is supposed to be limited to a maximum of 40 kilometres (24.85 miles) an hour by day, or 25 kilometres (15.53 miles) an hour for night traveling or driving carefully. In populated areas 18 kilometres (11.18 miles) an hour is laid down as a maximum. The same figure is supposed to be observed through villages in France. I use the word "supposed" advisedly, because the actual speed in practically every European country is not so much what the legislators choose to make it as what circumstances combined with discretion permit. As a matter of practical fact on some of the long straight stretches of routes militaires in France a man can drive at what pace he pleases without interference; while in some parts or on some occasions 6 kilometres may get him into trouble. Still the legal maximum speeds serve to give a fair idea of the rate of traveling generally practicable.

In Great Britain any automobile weighing up to 2 tons (a British ton equals 2240 lbs.) unladen is allowed a maximum of 20 m.p.h.; rubber tired cars above this weight and less than 5 tons unladen 12 m.p.h., unless the weight on any one axle exceeds 6 tons, when only 8 m.p.h. is allowed. If iron or steel tires are used on these big vehicles 5 m.p.h. is the maximum for cars of 3 to 5 tons unladen weight; 8 m.p.h. for machines weighing between 2 and 3 tons. In all cases cars weighing more than 2 tons unladen are restricted to 5 m.p.h. when drawing a trailer, though if they weigh less than this they can draw trailers at 20 m.p.h. Through certain villages the speed of all motor vehicles alike is restricted to 5 or 10 m.p.h., as the authorities may imagine that the circumstances require.

As a matter of fact, in all the different countries these speeds are seldom strictly

observed, because of the difficulty of distinguishing the niceties of gradation in speed; if a car is traveling considerably above or considerably below a given velocity it will attract attention, not otherwise, but more latitude is allowed in France than in any other country.

Road Conditions—Surface and Traffic

After all, as far as wear and tear is concerned, what chiefly matters is actual road speed exclusive of stops, although if stops are frequent enough, they may add materially to the wear. But most of the brake applications and gear changes occur in traffic, and the two chief influences are traffic conditions and road surfaces, the latter being by far the most important.

The influence of traffic conditions in a big town, however, may be very considerable. Some time ago the London General Omnibus Company found that in a double shift day of 18 to 19 hours, during which a 'bus did 115 miles of traveling in London streets, the car was stopped 690 times, gear was changed 1035 times, while 2530 brake applications were made. Then again, traffic may have a material influence on the wear of the steering gear.

The real secret of economic speed, however, lies with the road surfaces, and if vans and trucks in Europe travel faster than in America it may be set down almost entirely to this cause.

Some Generalities on European Road Surfaces

Of late years the roads in the United Kingdom have improved enormously except on roads over which a frequent motor 'bus service runs; really frequent services of this sort, however, are only found in the neighborhood of big towns, although they often extend a considerable distance out, some of the services running from London, for instance, reaching points more than 20 miles away from the capital. These services have a big effect on the road, causing the surface to become wavy, or, as it is termed over here, corrugated. These waves are extremely regular and though the dip between them is not great, it is sharp enough to make itself felt most considerably. Even to well sprung pneumatic tired cars such surfaces prove very trying; even on such cars the writer personally is impelled instinctively to slacken down, and on big heavy solid tired trucks the effect of prolonged hard driving over these roads can be very serious. At any real speed the regular and constantly recurring shocks from the waves has the effect of violent vibration, and it can be readily understood under such conditions that the horizontal component of the road shock is very considerable. Indeed the only reasonable way to drive a heavy solid tired car over such surfaces is to slow down. Luckily such lengths of road are the exception.

In the early days of the motor the roads of France were far better than the British

highways, but now neglect on the one hand and steady improvement on the other has tended to reverse matters, and even the beautiful routes nationales often hardly come up to the standard of the best British highways. The by-roads in France have never been very grand, in fact, not up to the British standard.

In the touring districts of Germany the roads are splendid, but elsewhere, especially in the manufacturing districts, they leave a very great deal to be desired, and are very severe on heavy motor transport.

But in comparing conditions in different countries the roads are not the only influences to take into account. Broadly speaking, the nationality of the driver is a far bigger item than is generally realized, and the roughness of the road in German manufacturing districts, where automobile trucks are most likely to be used, is to some extent made up by the stolid carefulness of the German driver and his terror of breaking the law; while the good highways of France are often discounted by the dash of the French driver. The Frenchman so frequently tends to over-drive, though he is splendid at getting the last ounce out of a car to the last minutes of its existence. Still, that last minute is often expedited by his rushing tactics. Quite a lot of French drivers simply will not realize that their three- or four-ton "camion" is not a racing car, and it is no uncommon sight to see a big rubber tired truck doing 20 or 25 m.p.h. on open stretches, while the lighter delivery vans on pneumatic tires are treated much the same as a private car, and may indulge in speeds of 30 or 40 m.p.h., although in towns where they are as yet far more generally used than in France their speed is such as not to make any excessive wear and tear demands in spite of the pave of the streets. I have driven in solid tired vans over Paris streets at a good 30 m.p.h.

Average Speeds for Average Types

Now what are the speed that result from such conditions? In Great Britain I am able to quote from actual examples. Taking the light three-wheeled delivery van, its actual road speed, apart from stops, works out to about 18 m.p.h. They are not fast vehicles, being by no means generously powered as a rule. The light pneumatic tired delivery van in actual point to point speed is rather faster, traveling at barely 20 m.p.h., but above the 1500-lb. or one-ton sizes we come to the solid tired species, and at once find a drop in the speed. Though allowed to travel at 20 m.p.h., a one- or one and a quarter-ton van on solid tires—as was proved from some tests carried out by the writer—only average 13½ to 14 m.p.h., excluding stops.

It is in this matter of speed that we see one of the objections to hard and fast lines of demarcation as opposed to a sliding scale in the regulations. Below 2 tons the legal maximum is 20 m.p.h., above this weight it is 12 m.p.h., and for this very reason

the two-tonner is apt to suffer from the wear and tear of speed more than any class of vehicle: too often it is loaded like a three-tonner and driven like a motor cycle; as a matter of fact, its speed is far too often that of the one-tonner, though owners and drivers vary a lot, and those that are giving good results appear to be kept down to an average steady road speed of about 10 m.p.h.

Of course, this does not say that on occasion they, or any of the other types, are not run a lot faster than the speeds quoted: given a perfect road surface the speed would not matter; the figures mentioned only serve to indicate the road condition relative to the class of vehicle.

There does not seem to be a very great difference between the economic speed (from wear and tear point of view) of the two- and three-tonner—perhaps a mile an hour—but between the three- and five-

tonner there is some gap. An average of 7½ m.p.h. on give and take roads seems quite enough for a big five-tonner on rubber tires, and if in attaining that average it reaches a maximum of twelve m.p.h. that is quite as much as is good for it, though many bucket along at a good 16 or 18 m.p.h. on road surfaces that cannot justify such speeds.

The speeds in Germany are much about the same as those in England, except in big towns like Berlin, where the drivers move like "cats on hot bricks" out of respect, or otherwise, for the police. Indeed, in Berlin the speed of motor traveling is appreciably slower than that of London, and far slower than that of Paris, where the pedestrian is responsible for getting out of the way of the car. Undoubtedly the conditions in France go to make the French drivers, who habitually drive faster than those of any other nationality in Europe;

in fact the speeds in France are too high for economy. It is no uncommon sight to see a three-tonner hurtling along at 20 or 25 m.p.h., and this, though necessary and usual in these present war times, is not business in peace time.

The fact of the matter is that the road and traffic conditions set the speed, and if either of these are neglected the repair bill is bound to step in as the limiting factor.

Roads and America's Chance

I believe that in America the greater part of your road systems have yet to be made, or at any rate remade; in such a vast country it would be surprising if it were not so. If I am right in this, I envy Americans their opportunity; for, given an enduring perfect road surface, all speeds that were practicable would be possible and reasonable. Think of the economy of such a road system!

British Military Transport Convoys, and How They Are Worked

MOST of the leading British makes of motor truck are by this time well represented behind the allied armies in the western theatre of war, and quite a number have already found their way to Russia. It is, in fact, stated that the Russian Government is dependent at least to some extent on Great Britain, not only for military motor vehicles, but also for drivers and officers for the transport columns. This, of course, is due to the comparatively small number of industrial motors employed in Russia, and the consequent lack of experience in their maintenance and control.

Of the British cars at the front I hear particularly good reports of the Leyland and the Dennis. Some of the cars of certain other makes that have gone out have not proved equal to the very rough work expected of them. Broken axles have not been uncommon, and certain makes are in consequence now generally employed for loads lighter than their stated capacities.

To Prevent Radiators Freezing Up

During the recent cold weather it is said that there has been trouble in starting up some of the sieve valve engines; also, that the inexperience or carelessness of some of the drivers has led to freezing and trouble with the water circulation of some of the cars. All the lorries now have their radiators filled with an anti-freezing mixture

consisting of about 70 per cent. water, 10 per cent. glycerine, and 20 per cent. methylated spirit or crude alcohol. After being filled, a distinguishing mark is put upon the bonnet to prevent drivers from draining off the water at night. Before a suitable mixture became available, either this was necessary, or else squads had to be deputed to start up the engines periodically during the night.

The Transport of a Division—The Supply Column

The ordinary divisional supply column behind an infantry division of the British army (which at the beginning of the war numbered 18,073 men, 5592 horses, 76 guns, and 24 machine guns) consists of forty 3-ton lorries and a workshop car. With this column are five officers and about 240 men. The commanding officer travels in front of the convoy on a touring car, and the officer commanding the workshop travels at the rear of the convoy. Subalterns and expert mechanics ride at intervals on motor bicycles or cars. At the beginning of the war, the first were generally used, but there is now a tendency to abandon them, owing to the difficulty of handling them safely on broken Belgian roads. These roads generally consist of about 15 ft. in width of pavé, on either side of which is an unmade strip which has now been churned up into soft mud. Consequently, the official regulations which pro-

vide that lorries shall always keep close to the near side of the road have had to be relaxed, and convoys now run on the crown of the road whenever possible. When, in meeting another convoy, or for any other cause, one of the driving wheels goes down into the mud, there is often a good deal of trouble in getting away again. The addition of some means of locking the differentials, such as is commonly found on British steam wagons, and steam tractors would be very useful under these circumstances.

Breakdown Organization

When one lorry of a convoy breaks down, the officer commanding the workshop stays behind to attend to it, sending forward a message by motorcycle to the commanding officer giving an estimate of the duration of the delay, and receiving in reply instructions as to where to rejoin the convoy. The standard workshop car carries a 3½-in lathe, a drill to bore holes up to 1¼ in., a fitter's bench and a portable forge. It is lighted, and its machinery is driven by a single cylinder motor running a dynamo.

Traffic Regulations

The official regulation is that while on the open road, the vehicles of a convoy are to keep 50 yards apart, and in town about 25 yards apart. In practice, this is not always workable. Drivers show a tendency to run up close behind one another on hills, a practice which makes collisions not infrequent, and shows the importance of the guards fitted in front of all the radiators.

In passing through towns, the interval between lorries has to be reduced, in order to avoid the column being cut by other traffic at cross roads. Thus, for example, if one convoy is cut by another at a cross road, its halves may be badly separated and considerable delay caused.

Another official rule is that when a convoy stops, the cars keep only four yards apart. This, again, is not usually workable. Considerable gaps have to be left at intervals so as to make it possible for two other con-



A Convoy of Dennis Trucks Leaving the Works at Guildford, England, For the Scene of War

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?

voys to get past if they happen to meet at the point where the first convoy is stationary. Of course, rules do not allow the vehicles in any convoy to pass one another on the road except in the event of a breakdown. Speed regulations provide for a maximum of 15 m.p.h. on the open road, and 8 m.p.h. in town and villages, but these limits are not uncommonly exceeded. Each lorry of the column carries four men; that is to say, a driver, driver's mate and two loaders. A very complete system has been worked out for the transfer of the loads from the motors to the horsed vehicles which deliver in detail when the re-filling point is reached. Nevertheless, there is reason to believe that there is a certain amount of unnecessary confusion along the main roads communicating to the front, owing to a more or less inevitable lack of expert traffic management. The problems involved in this are of course very difficult, and it was quite impossible for any adequate experience to have been gained in their solution prior to the war.

The Ammunition Supply

The figures given above referred to a divisional supply column only. The ammunition park of an infantry division consists of about one hundred lorries, and a correspondingly increased contingent of men. While many of the drivers of motors in the supply columns have been frequently under fire, and have on occasions worked right up to the trenches, every effort is made to prevent motors carrying large loads of ammunition from getting into dangerous situations. In fact, some of the officers working on the ammunition parks have not really seen anything of the fighting from the beginning of the war up to the present day.

Lighting

As regards the method of lighting the vehicles, it appears that electric lighting equipments are giving a good account of themselves, and are generally preferred to acetylene, as in the winter months the water used in connection with the latter not infrequently freezes up. Probably, however, it is just as well to have some acetylene lamps handy as a stand-by. The necessity for a good deal of continuous slow running at night has rubbed in the need of placing the lighting dynamo under the bonnet, or

Red Cross Ambulance Used by American Women's War Relief—London
Four berths and stretchers are supported as shown in the rear view

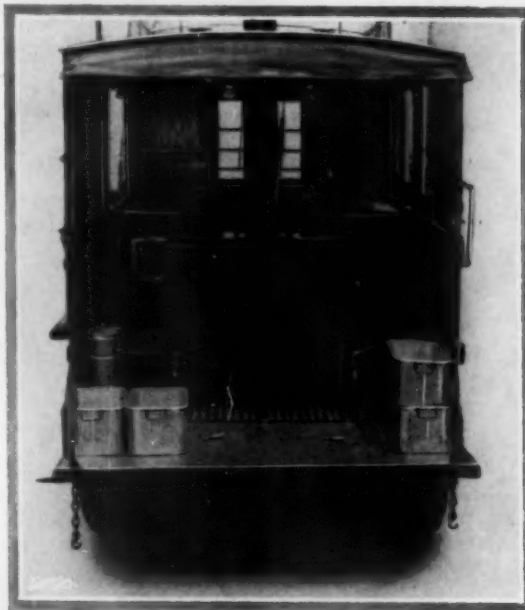


at least driving it from some point forward of the clutch. Especially in the case of the touring cars accompanying the convoys, any system in which the dynamo is driven from

stantly running at too slow a speed to provide adequate charge for the accumulators.

Red Tape

In the matter of repairs, the traveling

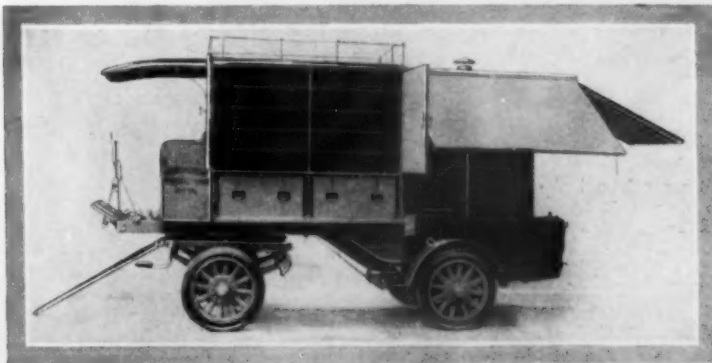


Showing the Inside of a Motor Field Kitchen Used by the Russian Troops

the cardan shaft is found to be inefficient, as the electrical machine is thus kept con-

motor workshops are of course proving invaluable. At various points, big permanent establishments for repair are in existence, but if report speaks true, the utility of these is to some extent lessened by the failure of those in charge to free themselves of the red tape which so often interferes with the efficiency of British Government work. The writer has been told that on some occasions at least, a car has been kept off the road for a long period because it did not happen to belong to the fleet which was supposed to receive attention from the particular repair shop available in the neighborhood where it chanced to break down.

On the whole, however, the British motor transport and supply organization is certainly deserving of praise. Its efficiency is steadily increasing, as the miscellaneous machines requisitioned at the outbreak of war are replaced by new vehicles of a limited number of types, and turned out by the best factories.



A Heavy Trailer Used by the Russian Government in Conjunction with the Motor Kitchen

The front part of this trailer is fitted up with shelves as a larder, the lower drawers containing cooking utensils, while a cooking range is situated at the rear

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

Maintaining the Efficiency of the Valves

By MURRAY FAHNESTOCK

THE "gates of the motor," as the inlet and exhaust valves are sometimes called, open and shut a quarter of a million times during the working day of the average truck. Small wonder, then, that the valves gradually get out of adjustment. But the designers of truck motors have realized this and ample provision is generally made for the adjustment of the motor valves.

When the Valves Need Grinding

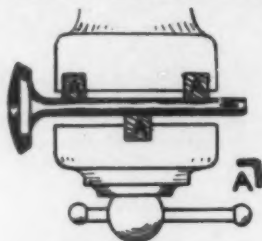
Turn the motor against the compression and notice if considerable force is required to turn the motor. The motor should be lively, that is, it should turn back quickly when the starting crank is released. A stiff, sluggish motor is more apt to have tight bearings than a good compression. Also, the force to turn the motor past each cylinder should be equal. If the compression of the different cylinders varies, the motor will run unevenly and power will be wasted. If the compression leaks too quickly, and the valve tappets are not out of adjustment so that they prevent the seating of the valves, it will probably be necessary to grind the valves. Trouble with the piston rings will result in poor compression, as will also leaky valve caps or spark plugs. But the leaks around the valve caps can be detected by squirting oil around the joints, while the motor is running, and then the leaks will be indicated by bubbles.

Perhaps a valve has been kept from seating by a fleck of carbon between the valve and the valve seat. If the valves do not have a bright, polished appearance, but are pitted and spotted, it will be necessary to grind them. However, there are several details, which should be noted, before starting to grind the valves. If the valves seem more burnt on one side, it is probable that the valve has become bent or warped, due to excessive heat. This is more apt to happen in the case of the exhaust valve, as it is opened while the gases are still burning and the valve stem is exposed to the burning gases as they sweep out of the cylinder. To test the valve stem, a piece of plate glass, or a steel surface plate, is needed. By rolling the valve stem along the plate, it is easy to determine if the stem is bent. If the head of the valve wobbles, it should be straightened, or, better still, replaced by a new valve. The valve can also be tested between the centers of a lathe, but a lathe is not available in most repair shops. Valve stems are sometimes straightened with a hammer, using light blows to stretch out the metal on the concave side; but the trouble is, that under the influence of heat, the metal is apt to warp again. The vise may be used for truing valves by using three strips of metal bent at right angles. One of these strips is placed against the convex side of the bend and the other two strips are placed on the other side.

Crude centers for testing valve stems may be made of two triangular wooden blocks, nailed to the bench, and supporting the valve, as shown. The wood screws, which

support the valve, should have conical points, ground or filed on their ends.

The valve stems should be cleaned and polished with very fine emery cloth, care being taken not to remove any more metal than is absolutely necessary. A shoulder



Straightening Stem

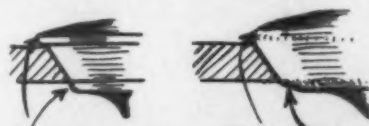
is often worn on the valve stem, where it emerges from the valve guide into the cylinder. If this shoulder is not filed down, it will not permit the valve to seat properly. Another place where shoulders are apt to form is around the valve seat. These can best be removed in a lathe, but, if carefully done, satisfactory results may be obtained by the use of a smooth file. The file should never be applied to the face of the valve, but should only be used to round the top and bottom of the valve seating, so that shoulders or ridges will not be formed as



Testing Valve Stem

the valve wears down. The slot in the head of the valve, and any other rough corners, should be carefully rounded off, as any rough parts are apt to become red-hot when the motor is running, and cause pre-ignition and knocks. It is better to remove the cylinders from the motor when grinding the valves, as it permits the inspection and cleaning of the piston rings and also permits washing the cylinders out with gasoline to remove any abrasive materials which may have gotten into the cylinders. If the cylinders are not removed from the motor, then a ball of waste should be shoved into the port leading into the cylinder. It is well to tie a string to this waste, so that it can be pulled out when the grinding is completed.

The grinding materials may be very fine emery mixed with oil, or one of the numerous grinding compounds now on the mar-



SHOULDERS ROUNDED
Shoulders Should be Removed

ket. These grinding compounds come in two grades, coarse and fine. The coarse grade cuts more rapidly and should be used until an even gray streak appears around the seating and all the depressions or pits have been removed. Then the finer grade may be used to obtain the final polish. Only the fine grade should be used for the inlet valve, as it is very seldom that it gets in such bad condition that the coarse grade is required. The grinding should be done with a smooth rotary motion and without great pressure, lifting the valve frequently to redistribute the emery, and also reversing the direction of rotation every few revolutions. This is to prevent particles of emery becoming imbedded in the valve and cutting grooves in the seating. Patience is necessary at this point, but the grinding of the valves is only necessary about every 5000 miles. The grinding may be done by the use of a round-handled screw-driver, rotated between the palms of the hands, or by the use of a brace and bit. The valve may be made to rise automatically, when the pressure is released, by placing a light spiral spring under the valve head. A spring for this purpose can be quickly made by wrapping a few turns of light steel or brass wire around a lead pencil. Only a small amount of grinding compound should be applied at one time, but it should be frequently replaced with fresh compound. After the valves have been ground, the space around the valves and the cylinder should be very carefully washed out with gasoline.

Valve Adjustment

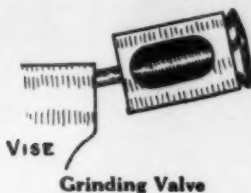
The next step is to adjust the valves. If it is difficult to replace the valve springs, they may be compressed in a vise and tied with string, thus keeping them closed until they are replaced on the valve. After the cotter pin has been inserted in the valve stem, the strings may be cut and the spring released.

It is possible that the valves may not be quite gas-tight immediately after grinding, but they will soon improve in use, as the hammering of the valves in action seems to bed them down to a more perfect seating. And, as the adjustable tappets seem to change after a little use, it is well to make the final adjustment of the valves after the truck has been in use for several days. The play in the screw threads or other means of adjustment seems to permit of a slight change in the adjustment when in use.

Valve Spring Tension

The valve springs may have become weaker from use, or they may have lost their temper from overheating, and, if so, they should be replaced with new springs. The tension of the springs can be quickly tested by prying the top coils of the spring farther apart, when the motor is running, and thus temporarily increasing the spring tension. If this causes a marked improvement in the running of the motor, the valve springs are too weak and should be replaced. For an emergency repair on the

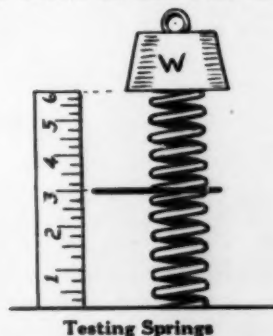
road, it is often possible to remove the springs and stretch them out so that the return trip can be made; but this is only a temporary repair, for the stretched-out springs soon return to their former condition. While it is possible for an expert to



re-temper springs, yet the steel used for spring making varies so widely that it is not advisable for the average garage to attempt this work, as different tempering methods must be used for different qualities of steel.

The strength of valve springs may best be tested by comparison with new springs. A simple test is to place a new spring against the end of an old spring and then to compress them to their length, when in use on the valves. If the change in length of both springs is the same, when both springs are arranged in this tandem fashion, then the strength of the springs is equal. It is also well to test the springs of the different cylinders against each other, as more even running will be secured, when all the springs are of approximately the same strength.

When the valves are seated in cages, which can be removed from the cylinders, it is often easier to grind the valves by gripping the valve stem between the jaws of a vise, and rotating the valve cage by twisting the wrist. It is also easy to test valves so arranged by holding the valve in a vertical position by its stem and then pouring gasoline in the valve cage. If no gasoline leaks through between the face of the valve and

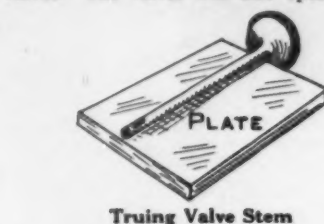


its seat in the valve cage, it is probable that no gases will leak through, for gasoline is more penetrative than water.

Valve Tappet Adjustment

The best adjustment for the inlet valves is just sufficient clearance to enable the valve to seat firmly, and this may be measured by so adjusting the tappets that a sheet of paper may be slipped in and out between the valve stem and the tappet without binding. The clearance between the tappet and the exhaust valve stem should be somewhat greater, as the exhaust valve becomes hotter and so has a greater tendency to expand. The thickness of a visiting card will usually be found to give the best results. The smaller the clearance the less will be the noise and hammering of the valves. The valves will also open earlier

and giving more power. The earlier opening of the exhaust valves also permits the hot gases to escape before they have communicated their heat to the cylinder walls, thus reducing the tendency toward overheating.



The valves of some motors work more freely if kerosene is squirted over the valve stems occasionally to cut the gummed and sticky oil, which collects and prevents the smooth action of the valves. Worn exhaust valve guides may cause additional noise, due to the escape of the gases, but worn inlet valve guides may cause erratic running of the motor, due to the ingress of air, which spoils the evenness of the mixture admitted to the cylinders.

BOOST FOR GOOD ROADS

The next few years is going to see a big demand for motor trucks for stage lines and short haul freight business. Throughout the western country, especially, anyone who makes an investigation of the number and length of present stage lines will be surprised by the size of the figures. The motor truck has made a good start on this business already, certainly enough to show that with moderately good roads it can make good, perform the service, and

make money for the owner, if he is a hustler and a good manager and able to take care of the mechanical proposition.

Buyers should avoid the mistake of getting too heavy trucks. The sales manager of a company which does a very large business in the West cites an instance where a man "fell down" through getting a heavy truck to operate on a road through sandy country. The gage was several inches wider than the prevailing gage of horse-drawn vehicles, so it could not travel in the ruts which they packed and was up against the worst possible sand conditions, with the result which might be anticipated. In other cases trucks have made good upon some of the hilliest country where the roads are fairly good, and are being used not only on stage routes, but to carry supplies to mines and timberland far from a railroad, thus aiding in the development of these projects. In other cases they are making good on short haul propositions. Some instances are on record where motor trucks are used in regular commercial hauling across country between sections which are well developed, but are connected by railway only indirectly, that is by a V-shaped route, while the motor truck cuts across. A good example of this is the line running between the rich Imperial Valley agricultural section and the City of San Diego, Cal. The advantage of the motor-truck service in this case, and also for the short haul proposition, is simplicity of service and reduction in the numbers of times that the goods must be handled and speed of service from terminal to terminal. Where these conditions are right, and there is not only sufficient traffic, but business is so conducted that it can be distributed so that it will not be either a feast or a famine, but rather a fairly steady hauling proposition without too much empty traveling in either direction, things are favorable to success in this line.



Rowe Truck, in Grocery Business, Exceeds Owner's Expectations

The commercial car illustrated above has been in daily service nearly five months, and during that time has not cost the owners one cent for repairs. The owners, A. J. Hart Company, Wilmington, Del., say that it has far exceeded their expectations, owing to their having used horses entirely, and they did not think it possible for a truck to take care of the business and keep going as it has done. The truck is a two-ton worm-driven Rowe, made by the Rowe Motor Manufacturing Company, of Downingtown, Pa.

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- Eagle Warehouse & Storage Co., 25 Fulton St., Brooklyn, N. Y.
- Eastern Asphalt Paving Co., 115 Broadway, Eastern Dist. Dye Works, 260 Norman Ave., Brooklyn, N. Y.
- The Ebling Brew. Co., 760 St. Anns Ave., G. Ehret, 235 E. 92d St., N. Y. City.
- J. Ehrgott & Co., Inc., 3 Simons Block, Arverne, L. I.
- J. Eichler Brewing Co., 3582 3d Ave., N. Y. City.
- Elete Co., 11 W. 36th St., N. Y. City.
- Elias Brew. Co., 403 E. 54th St., N. Y. City.
- J. Elwin, 1037 Fulton St., Brooklyn, N. Y.
- Empire Carrying Corp., 44 Court St., Brooklyn, N. Y.
- Empire City Sub Co., Ltd., 426 W. 58th St., Empire Serv. Carrying Corp., N. Y. City.
- Empire State Dairy Co., 502 Broadway, Brooklyn, N. Y.
- G. C. Engel Co., 99 Barclay St., N. Y. City.
- M. Englander, 5 E. 109th St., N. Y. City.
- J. Everards Breweries, 12 E. 133d St., N. Y. City.
- Excelsior Brewing Co., 254 Hart St., Brooklyn, N. Y.
- F. & P. Auto Trans. Co., 201 St. Marks Ave., Brooklyn, N. Y.
- The Fairbanks Co., 416 Broome St., N. Y. City.
- D. Falconer Contg. Co., 183 Jamaica Ave., Astoria, L. I.
- Farmers Feed Co. of N. Y., 532 E. 76th St., T. F. Farrell, 147 W. 93d St., N. Y. City.
- Federal Sugar Ref. Co., 138 Front St., N. Y. City.
- Fifth Ave. Coach Co., 10 E. 102d St., N. Y. City.
- Fire Ins. Salv. Corps of Brooklyn, 123 William St., N. Y. City.
- Fireproof Products Co., Inc., 257 E. 133d St., Firestone Tire & Rubber Co. of N. Y., 1571 Broadway, N. Y. City.
- R. Fitzpatrick, Inc., 454 W. 19th St., N. Y. City.
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- Frank Brewing Co., Cypress & Willow St., Evergreen, L. I.
- General Baking Co., 541 E. 81st St., N. Y. City.
- General Chemical Co., 25 Broad St., N. Y. City.
- Gimbel Bros., 1275 Broadway, N. Y. City.
- Glen Cove Transfer Co., Glen Cove, L. I.
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- Goets & Co., 81 Court St., Brooklyn, N. Y.
- Goldenberg Bros. & Co., 109 5th Ave., N. Y. City.
- Goodman Motor Express & Van Storage Co., 21 W. 20th St., N. Y. City.
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- The Goodyear Tire & Rubber Co., 1972 Broadway, N. Y. City.
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- Great Atlantic & Pacific Tea Co., 150 Bay St., Jersey City, N. J.
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- Greenpoint Metallic Bed Co., 226 Franklin St., Brooklyn, N. Y.
- Greens Auto Vans Exp. Co., 178th & Morris Pl., N. Y. City.
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Wright Cake Co., 149 N. 1st St., Brooklyn,
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Sonora County Transportation Company
is operating a motor 'bus line between Napa
and Santa Rosa, Cal.

Consolidated Auto 'Bus Company, Los
Angeles, Cal., has been incorporated with a
capital stock of \$50,000 by T. J. Morgan
and others.

Isador Spangler will establish a motor
'bus service between Cripple Creek and
Canon City, Colo., as soon as road repairs
are completed.

Electric Trucks in Kansas City

By W. D. MENG



KANSAS CITY is just beginning to appreciate and to use with any ways near the fullness of their possibilities the electric trucks. The industry for a few years labored under the disadvantage of inadequate facilities for charging the batteries. The

Kansas City Electric Light Company has an adjunct company known as the "Electric Truck" concern; it has seventeen rheostats at its charging station at Thirteenth and Charlotte Streets. This station has been utilized almost to its capacity since its installation, and as more electric trucks are bought and put into use in Kansas City, their maintenance is made possible through the installation of rheostats in private garages which relieves the number using the Electric Truck Company's facilities. A few of the electric motor car companies maintain their own charging stations, but these care only for the lighter vehicles, both pleasure cars and trucks. The Woods Electric has a gas engine electric plant. The Muehlebach Brewery, with fourteen big G. V. electric trucks, maintains its own charging facilities in connection with its steam plant. Within the past two years several large concerns which use trucks, formerly patrons of the Electric Truck Company's charging station, have installed their own charging plants, getting current from the Kansas City Electric Light Company. The Schoenhofen Brewing Company is one of these. It has a fleet of General Vehicle trucks. The Ridenour-Baker Grocery Company has recently established a charging plant in the West Bottoms for its General Motors trucks. This is the only charging station in that wholesale district for electric vehicles, but it is said that so far the Ridenour-Baker Company has cared only for its own batteries. The Duff-Repp Furniture Company, running several large G. V. trucks besides its smaller delivery wagons, has now its own charging station. The Peck Dry Goods Company and the John Taylor Dry Goods Company, with Detroit electric delivery wagons, maintain their own charging stations at their storage warehouses. There are many other firms using the lighter trucks and delivery

wagons which maintain their small charging stations or get their batteries recharged at the stations maintained by the automobile companies. These companies generally care for transient charging business as well as for the batteries in their own cars. One of the most extensive users of electric trucks in Kansas City is the Kansas City Star. It maintains a large fleet of G. M. C. light trucks for the transportation of its papers to the post-office, the hauling of papers and the delivery of its various editions to the city stations.

The Metropolitan Street Railway Company runs several electric trucks, charging them at its own station at Fifteenth Street and Grand Avenue.

The Kansas City Electric Light Company maintains several electric trucks and delivery wagons which it charges at the Electric Truck Company's station. At this station now the two Walker trucks of the Franklin Ice Cream Company, the big Walker truck of the Terminal Warehouse Company, the half dozen G. V. trucks of the Val Blatz Brewing Company, are regularly charged. The station also cares for a large number of other electric vehicles. An instance of its ordinary business is that on a recent day fifteen of the large trucks regularly cared for were charged in 24 hours and, in addition, twenty-five pleasure cars were charged. The company can normally care for about twenty trucks.

The capacity of the central charging station, while unlimited as to current, is dependent somewhat as to the number of customers cared for as to the length of time necessary to charge the batteries. Ordinarily the trucks charged here have been in constant use and therefore require from 6 to 9 hours for charging. A reduction in the length of time necessary for the service would of course largely increase the number of cars possible to charge. It would seem that the electric truck industry in Kansas City has already grown beyond the local facilities. Users who need several trucks, enough to make a private charging station profitable, are in the clear, for they can get the current. But the facilities for the owners of single trucks are apparently inadequate.

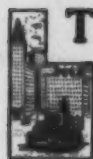


The Thirteen GMC Electric Trucks of the Kansas City Star

They are charged at the Star's private plant. Each is given two charges a day, of three and a half hours each, the cost of the current being estimated at three cents per k.w., amounting to about \$16 per month per car. The lubrication for these electric trucks costs about \$5 per year. These electrics use twenty gallons of distilled water a month in the batteries.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

Mercury Motor Snow Plow and Sweeper



THE removal of snow from city streets and drives is a costly but necessary procedure, and every hour's delay not only makes the final removal more troublesome and expensive, but adds to the difficulties of road vehicle operation. Every inch of snow decreases the efficiency of horse-drawn equipment and the longer it remains on the streets the greater is the loss to merchants with deliveries to make and more seriously is the public at large inconvenienced.

But it is hardly necessary to enlarge upon the necessity of removing the snow quickly, and no one will deny that improved equip-

signed to exert a straight drawbar pull after the manner of a locomotive, i. e., without carrying any part of its loads, and at the same time having the ability to get behind and push with equal force. The tractor has proven a great success in handling long trains of trailers, pulling street sweepers, snow drags, snow scrapers, lumber wagons and other tractor work, and has developed into an ideal power unit for pushing snow plows. It develops a pulling power equal to more than six strong horses, and operates at speeds up to 8 m.p.h.

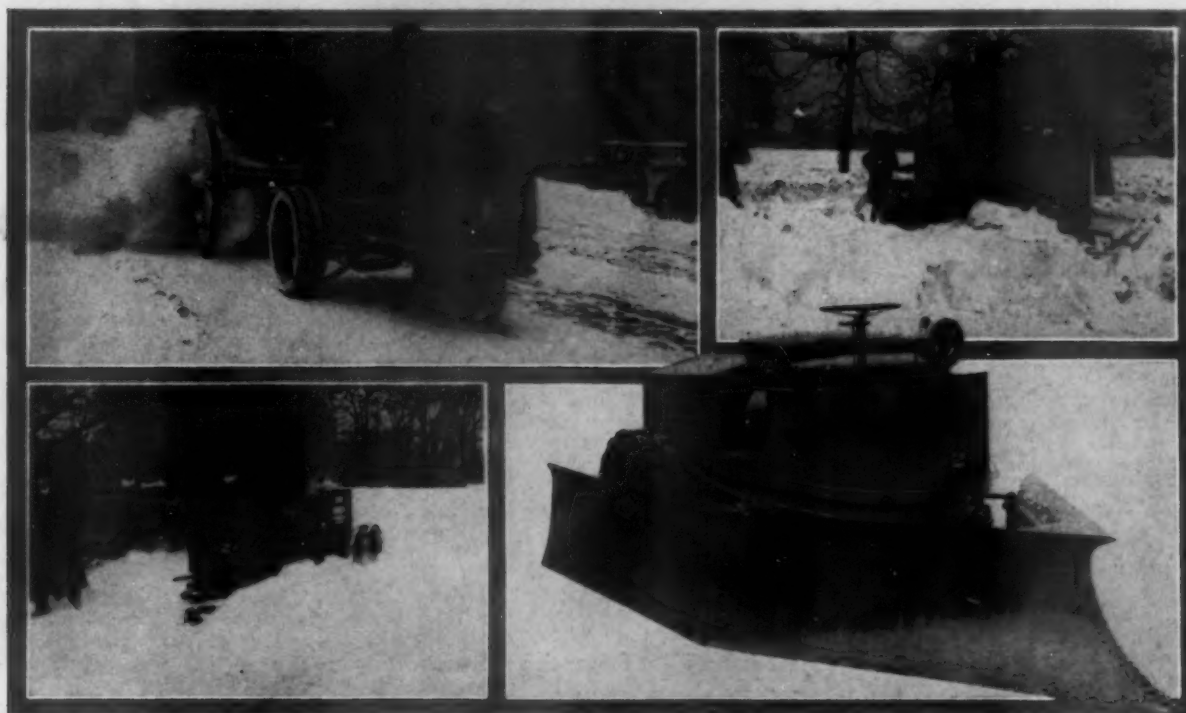
Mercury Snow Plow

The Mercury Snow Plow resembles the very effective railroad plow more than the

and detached in 5, leaving the tractor free to perform its ordinary duties in hauling road vehicles.

The unit consists of a "V" shaped main member, properly formed to lift and displace the snow to the best advantage, and an arm 8 ft. long attached to the right-hand rear of the "V" shaped piece and easily adjustable, so as to increase or decrease the throw of the plow. The main member may be used without the extra arm.

The rear ends of the main member are supported on two caster wheels, and the front on a flanged guiding wheel, mounted on a fork and turned by a gear and wheel



The Bulley Tractor Removing Snow

These views show the Bulley Tractor, made by the Mercury Manufacturing Company, fitted with a snow plow, and one of the views shows it hauling a sweeper

ment is needed. In fact, countless experiments have been conducted with that end in view.

Were it possible to quickly plow out a roadway and bank the snow to the curb, or in the center of the street, the final removal could be made more cheaply and traffic delays would be greatly reduced. We must "get" the snow before the snow "gets" us. If the street-car companies did not send out electric sweepers as soon as there were indications of a heavy snowfall, the lines would be hopelessly blocked in a few hours.

The Mercury Bulley Tractor

For two years the Mercury Manufacturing Company, of Chicago, Ill., has been building the Bulley Tractor of both three- and four-wheel types. This machine is de-

signed to exert a straight drawbar pull after the manner of a locomotive, i. e., without carrying any part of its loads, and at the same time having the ability to get behind and push with equal force. The tractor has proven a great success in handling long trains of trailers, pulling street sweepers, snow drags, snow scrapers, lumber wagons and other tractor work, and has developed into an ideal power unit for pushing snow plows. It develops a pulling power equal to more than six strong horses, and operates at speeds up to 8 m.p.h.

The plow differs materially from any other used for this work in that it is flexibly attached to the power unit, rests upon its own wheels, and is free to articulate and conform with the road surface regardless of the position which the tractor may assume. The principal feature of the machine is not the shape or outline, but the method of attaching the plow to the tractor and the self-steering control, both of which are new.

The plowing unit may be attached to the tractor and ready for use in 10 minutes

arrangement directly attached to the tractor steering turntable. The framework is of heavy channel and angle iron riveted and welded together. The heavy bent plates, forming the blades, are riveted in place and reinforced by channel iron ribs and angle iron lengthwise members.

There is less than $\frac{1}{2}$ in. clearance between the plow and the ground, which insures a clean street. The "V" end is fitted with a strong, tilted prow, so that when an obstacle is met which cannot be plowed aside, the plow either mounts over it or sheers to one side.

The snow plow is attached to the tractor at three points, but none of the connections are rigid. A detachable forging is fastened to the front of the tractor by two

The CCJ has most readers because it gives most information

bolts, and through a hole in this forging the vertical driving post of the snow plow passes.

The rear end of each side of the "V" main member is flexibly attached to the tractor frame by a bent round iron passing through a swivel bolt.

The flanged guiding wheel located just behind the "V" point of the plow is actuated by two heavy steel wire cables attached to the tractor steering turntable.

The extra plowing arm may be attached to the rear end of the right side of the plow by a long swivel bolt. The rear end of this extra arm is supported on a caster wheel and connected with the rear of the tractor by a braced, telescopic extension rod. The length of the rod can be quickly adjusted to give the extra arm a throw of from nothing to 6 ft.

"It Works"

"The best thing about that machine is that it works," said a Chicago park commissioner after he had tested out the Motor Snow Plow in Washington Park on December 30 and 31, 1914.

On the night of the 28th the heavy fall of snow was thoroughly drenched with a warm rain, and for that reason the park commissioners delayed the test until the snow had become firmer, believing that the ability of the machine would be more clearly demonstrated.

During the night of December 29th, the thermometer took a drop until the mercury hovered around the zero mark, and the great blanket of snow froze good and hard. Wednesday morning, December 30th, the Motor Plow went to work on the drives of Washington Park, Chicago, and plowed on until Thursday afternoon.

In scraping off some of the drives the horse-drawn equipment had banked the snow at the entrance to connecting roadways. When opening up one of these snow-bound drives, the motor plow merely backed off and "rammed" the small mountain like the old locomotive snow plows used to do.

In the haste to get a passageway for the automobiles only a narrow strip down the center of the drive had been cleared by the scrapers. The snow froze solid and the motor snow plow was put to work at the arduous task of widening the cut. It surprised the assembled group of park commissioners and moving-picture operators by being able to hold one side of the main member of the plow against a 12-in. bank of frozen snow and turn back the bank using the entire length of the blade.

Two Bulley tractors, one equipped with the Mercury Snow Plow and the other drawing a snow sweeper, did more than their share of cleaning Michigan Avenue, Chicago, during the heavy snowfall January 20th and 22nd. With suitable approaches they mounted the wide sidewalk along Grant Park and first plowed out a passageway and then swept the walk clean.

When the snow first began to fall, the motor-drawn sweeper cleaned up the avenue easily, but the storm increased and the plow went to work, first opening up a passageway, and then banking the snow at the curb and also in the center of the street. The sweeper followed and left clean pavements for the thousands of automobiles.

Motor Service of Southern California Gas Company

By FRANK REED



NINE trucks are operated by the Southern California Gas Company. Two five-ton machines are employed almost exclusively in hauling supplies from the company's main storage station in Los Angeles to outlying points, and on construction work. They carry heavy pipes, meters, fittings, stoves, etc., to the company's stations at suburban and nearby points.

Five medium-capacity machines are used by the service gangs. These consist of two two-ton Moores, one one and a half ton Moore and two 1800-lb. Randolphins. They carry meters, service pipe, etc. A great deal of the installation work is done in apartment houses and business buildings, where material for two dozen services or more at one place is put into the trucks.

Two I. H. C. 1000-lb. wagons are used on light work, carrying a single man, who goes out to set a new meter, turn on the gas, make shut-offs, etc. Taking all kinds of the work done by these machines, it is found that loads seldom exceed 300 or 400 lbs. The machines have not the capacity for the materials demanded by service work, and are too heavy and too slow for the lighter work, which is now assigned to Ford Model T cars, of which there are five in service, bought since the 1000 lb. vehicles demonstrated that they were not the economical type for this class of work.

Jones' Speedometers are used to check over-driving. Before they were installed there was a good deal of axle trouble from speeding. The machines were put in good shape, speedometers installed, and a system of warning and discharging put into effect which has cured this difficulty. The man in charge of this fleet believes in locked governors on engines. He says this is a positive method that saves both the car and the man.

Advance Night Preparation of Loads

The quick get-away in the morning has been well developed by this company. Garage, shop and storeroom are located in a close group on the same lot. Truck repair supplies are located in the end of the storeroom next the office of the garage shop, with a wicket between. At the other

end of the storeroom are located the service supplies. Men come in here at night with their trucks, turn in their meters and check in their orders. Then they fill their machines. After this they go to the dispatcher's office and get printed form orders for material they will use on the next day's work, which they turn in to the night man at the storeroom. He fills the orders, placing those of each man in a box, or boxes. In the morning all the drivers have to do is to check over their material with the orders, then pass the material aboard the trucks. While they are doing this, the morning man is getting their meters, which they load after the other material, and immediately get under way.

Twenty-Four Hour Working Day For Truck Investment

From an investment standpoint, the efficiency of the heavy trucks was well demonstrated in a period of extra construction activity, when the company was laying a pipe line at Redondo. The excavation was done by very efficient labor-saving machinery, and normally a good deal of expense would have been incurred for team hire, to get pipes, etc., to the trench as fast as the excavating machine could travel. The trucks saved this however, as the machines cost no more in the items of interest on investment, etc., while working both day and night and very little more was chargeable to wear and tear. They simply put on more men, and worked the two five-ton trucks through the 24 hours. Trailers were satisfactorily employed for transporting 40-ft. pipe. The Moore truck has been used with two trailers, each carrying a separate load, making an aggregate of 12 tons, four trips in the 24 hours, 28 miles to the round trip. The Alco has also been subjected to overload at times. By one performance it emphasized the point that in loading a truck it is necessary to consider not only what the vehicle itself will stand up under, but all the conditions from the beginning of the trip to the end. This truck, 2 years ago, carried 9 tons of pipe safely as far as the Santa Ana Bridge, and then went through.



Illuminates Bodies on Trucks, for Night Advertising

The first body has animated figures moving across the panel, this being by electricity. The second body is a picture box idea, with the words illuminated. Large storage batteries are carried to light the panels. This is a form of advertising which, it is thought, will become popular.

The CCJ has most advertisers because it gives them biggest returns

DETROIT SALES MANAGERS TELL OF IMPROVEMENTS IN SERVICE SITUATIONS

By HERBERT L. CONNELL



OF all the words in the truck dealer's vocabulary there is probably none that has been more misused and misunderstood than that short word service. Not only the word but the functions for which it should stand have been abused by dealers, salesmen and owners. Of late, however, manufacturers and dealers have had the courage of their convictions and have squarely met the problem with the result that service policies are much more clearly defined than ever before.

About a year ago the General Motors Company announced a sweeping decrease in prices and cutting out of so-called free service. How successful this radical change from old established sales customs has been is shown in an interview with J. C. Ayres, manager of the company's Detroit branch. Mr. Ayres stated that the elimination of false overhead, as he called it, of the old free service had been so successful that his branch had gone a step further and disposed of its garage and repair business.

This new order of things took effect on December 1. Men who worked for years in the truck repair department have formed a company which will specialize in the care and repair of G M C trucks, and have leased the garage space which has been used by the sales company for its service station. The sales offices will continue in this building and the force will be made up of the regular salesmen and but one mechanic, who will act simply as a service inspector.

Besides the sales office the branch will continue its show room and large stock of parts. The mechanic will make regular inspections on the owner's premises. An interesting feature of the new arrangement is that when new trucks are driven over the road from the factory at Pontiac they will be washed by the new garage and a charge made to the branch. The idea is that the branch will not be carrying the overhead of a wash stand, but will know just what such items are costing it and will figure them in as part of the selling expense.

The Location Not Too Central

Mr. Ayres also brought out an interesting point in regard to the location of truck sales rooms. The Detroit branch has been located for a number of years at a distance of 1½ miles from the retail business center. It is on one of the main car lines, but in a direction different from all the other truck sales rooms or pleasure car agencies. Under the new arrangements it would have been possible to establish a centrally-located down-town show room. Not only would such a show room increase the overhead, which in the truck business should be kept at a minimum, but at such a sales room there would be many more callers who would just "drop in" to look the line over without being really interested. The old sales room was retained, for although

it is easy to reach by either street car or automobile, it is out of the way enough to mean that callers do not come unless they are really interested, and they, therefore, get better attention than if the salesmen were called upon to talk to a large number of non-interested persons a day.

Packard Defines Policy

A good deal has been done lately by the Packard Motor Car Company in clearing up the misunderstandings regarding service, by putting the service policy in cold type. Large placards have been printed, stating in clear language just what the owner is to expect in the way of service and also the standard truck warranty. These are framed and hung in the offices of the Packard dealers so that all prospective buyers may read them. The same statement is now also made a part of all truck sales contracts.

Among the items covered in this service statement are definitions of minor adjustments, rules governing the inspection of trucks, etc. All this is told in short form so that it can be easily read and understood. The advantages of this statement were pointed out by Walter Stebens, manager of the Standard Auto Company, which distributes the Packard in Detroit

territory, who says that it eliminates any tendency for salesmen to intentionally or unintentionally give wrong impressions to a prospective customer as to what service to expect. The statement certainly makes for a better understanding between the makers and owner.

Separate Truck Salesmen

The Standard Auto Company is engaged in the sale of both pleasure cars and trucks and his experience has been that one man should not try to sell both classes of cars. It is essential, in Mr. Stebens' opinion, that the truck salesman should have had factory experience and should thoroughly understand the truck he is selling.

In regard to drivers, Mr. Stebens said that although the number of drivers available was much greater than a few years ago, the quality had not greatly improved, and that the makers, therefore, have had to improve their product to meet the short comings of the average driver. He cited the real economy to the owner of paying for a first class man and gave as an example a large office furniture and supply house which pays its driver about \$25 a week and which has never had its truck in the shop except for the periodic inspections.

Follow-Up Letter as an Aid in Convincing the Prospect

By W. B. PARKER



WHAT effort does the average salesman put forth to secure sales? Two problems confront him, first, to convince the prospect that his business will be facilitated by using commercial cars, and second, to sell him the particular car he represents.

It is generally conceded by dealers, branch managers, and salesmen that there is nothing like consistent personal solicitation in making sales, and that such solicitation is very much better than mail follow-up systems. However, there are instances in which follow-up systems can be used to advantage. When personally visiting the prospect the salesman can judge as to what points are considered the most important by the possible purchaser, and govern his sales talk accordingly. Also the prospect will usually listen to a fairly long talk that will bring out all points of importance, while the same man would not read a lengthy letter or wade through a mass of printed matter.

Mail order houses have proved nevertheless that it is possible to sell high priced articles such as farm machinery, etc., entirely by mail. These companies, however, are selling goods as a rule to those who are not business men, but men who will read much longer letters than would men that are in the market for motor trucks.

The problem therefore becomes one of suiting the selling methods to the prospect, and this prospect usually feels that "time is money," and is most strongly attracted by snappy—short but forceable presentation of the subject.

In the opinion of the writer a follow-up system as an aid in the sale of commercial

cars should consist of five or six letters, and one enclosure of printed matter with each letter. The first letter should dwell on the value of a truck in the prospects business. The enclosure should contain experiences of users of trucks in the same business as the prospect. The second letter should detail the possible expansion or final economy brought about by using trucks in that particular line of trade, backed up by further experiences of users of your make of truck. The balance of the letters should deal with some one reason why the truck you are representing will give the prospect the service he desires. The printed folders or leaflets which accompany the letters should match the letters; that is, they should enforce, more at length, the selling reason advanced in the letter they accompany.

As to the length of the letters it is a good rule never to send a follow-up letter that exceeds five paragraphs of not more than six or seven lines each. The instructions of one prominent manufacturer to his advertising department are: "If you can't say it in five paragraphs, don't say it at all." The printed matter may be as long as necessary to bring out the points desired, as in this case the recipient does not feel that he is being compelled to read it, and is therefore much more likely to spend the time necessary to go over it than he would be to read a long letter.

As to the wording of the letters, a few general suggestions can be given that may be found of use. The first paragraph should be strong enough to insure the reading of the balance of the letter, and the last paragraph should always contain a

question. Below is a sample of a letter that could be used as the first letter of the series. This letter, of course, is based on the presumption that a folder will be enclosed of an educational nature as to the use of commercial motor cars in general and in the prospect's business in particular.

DEAR SIR:

On page three of the enclosed folder, second paragraph, you will find a dollars and cents reason why we believe you should read the balance of this letter carefully, as well as the folder itself.

There is an opportunity for business profit and expansion by an investigation of the use of trucks in your business. We are willing to match our time against yours, without obligation of any kind on your part, to give you such information. Just read the enclosed matter and see what others in your line have done with trucks. If you believe your business presents new problems we shall be only too glad to send an experienced man to talk the matter over with you. In justice to yourself you should know whether trucks can be of value to you or not.

Why not dictate a note to us now, while you are thinking about it?

Yours very truly,

It will be understood that this letter is merely a suggestion, and that the wording should of course be changed to meet various conditions. Imitation typewritten letters are usually a mistake, which is another reason why letters should be short enough so that they can be actually written without taking too much time of the stenographer. The best quality of stationery should always be used, and there should be nothing about the letter suggesting that it is a form letter. If convenient, a change in the style of letter-head should be made after sending two or three letters, and it is also advisable to use different sizes and styles of envelopes. This obviates that appearance of sameness that sometimes detracts from the value of follow-up letters.

For the same reason it is a good plan to have the several letters signed by different men. The first and second letter could be signed by the "assistant sales manager," then several by the "sales manager" and the last by the "president." There are several reasons for this, one being that where no reference is made in the letter to preceding ones, and the signature is different, it is not as likely to create that feeling of irritation that an evident follow-up letter sometimes does. Another reason is that the recipient feels flattered at receiving the personal attention of the "sales manager" or "president."

The use of return inquiry cards or return envelopes either stamped or unstamped, is of doubtful value in dealing with business houses of any size. They usually prefer to use their own stationery and resent any inference that they are compelled to answer by reason of postage enclosed. In other words, the appeal must be as dignified, courteous, and business like as is your general correspondence.

Wm. A. Hansen, Sykesville, Md., bought a Little Giant truck for a 'bus line between Sykesville and Westminster.

Manhattan-Joliet Auto-Bus Company, Joliet, Ill., incorporated with a capital of \$1000, to conduct express, auto and 'bus transportation business.

HOW THE WHITE AND G M C ARE REPRESENTED IN LOS ANGELES

The dealer who sells good trucks plus good service, at a reasonable price, and takes care to get his pay so that he can stay in business and give one man as good a deal as another, is bound to see his business grow. That is the idea on which the Pioneer Commercial Auto Company of Los

MOTOR TRUCKS OF PACIFIC ELECTRIC RAILWAY

Paving work of the Pacific Electric Railway is done so efficiently by a system employing motor trucks, that the former results obtained by the use of horse vehicles, are not considered worthy of comparison by men who are familiar with the situation. The company at present owns two



Home of Pioneer Commercial Auto Company, Los Angeles, Cal.
It contains garage, service station, machine shop, body shop and painting rooms, being a big factor in landing repeat orders

Angeles, distributor of White and G. M. C. trucks, has been operating. From a start in a little 50 x 50-ft. place in 1908, it has grown to proportions requiring as great floor space for its sales and service department as is occupied by many factories holding places well up in the ranks of truck production.

This company features service. A comparison of the expenses of some of the truck owners who avail themselves of this service with the expenses of others who garage their trucks themselves and shop around for repairs, which the writer has had opportunity to make entirely from the owners' records, shows that the latter pay dearly for the privilege of running the details of mechanical upkeep in their own inexperienced way.

O. R. Fuller, president of the company, places heavy emphasis on the value of their service to truck owners. They are equipped to supply it. Their building is well located with respect to the heavy business district, and takes advantage of a grade to get a street entrance on two floors. There are 36,000 sq. ft. of floor space on the three floors, with finely equipped and well-manned machine, blacksmith, body-building and paint departments. They do all classes of repairs, even to grinding cylinders.

The company has done considerable local advertising, but do not give it much credit for helping sales. While their advertising in local mediums has not brought very noticeable advantages, they feel that they have been helped a great deal by strong national advertising of the machines they represent.

three and one half tons Moore dump-trucks which it employs on its paving work. In patching, a truck easily displaces three teams, and requires no larger gang than was necessary for each of the teams displaced. On long haul work, a truck's performance is equivalent to that of ten or twelve teams.

The company rents five-ton Moores for construction work, and finds that there is a big advantage in getting a paving job cleaned up quickly, so that it will not be an eyesore to the public, and interfere with traffic, and does this with trucks at less cost than with horse wagons.

An example of the exact service performed:

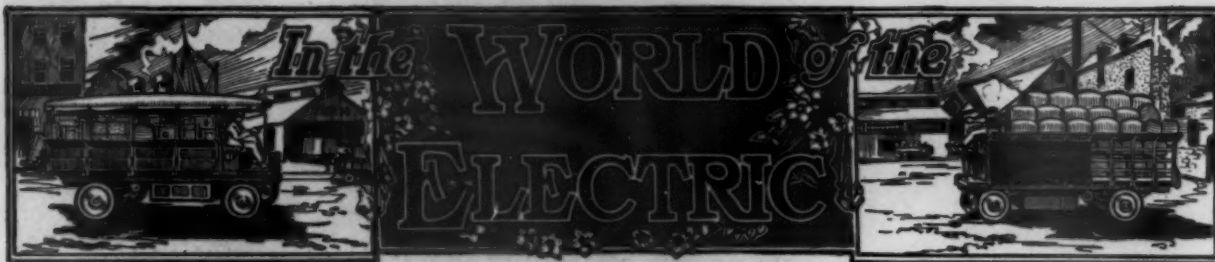
August 27, two rented five-ton Moore dump-trucks, working at Santa Monica hauling asphalt macadam from Fourth to Twenty-second street, a nineteen-block haul, transported 208 boxes of asphalt macadam, 1872 cu. ft. of asphalt, carrying sixteen to eighteen boxes to the load.

On contract work, the company only uses teams when they have to, as they find trucks more economical. They have been using trucks for the last two years only, but this has been sufficient for them to prove their merit and ability to meet any situation which arises in the work.

Auto Truck & Drayage Company, Youngstown, Ohio, has been incorporated with a capitalization of \$10,000.

E. G. Escalante, of Liberty, Md., will operate a 'bus line between Frederick and Baltimore, Md., at a lower rate than those to be put into effect by the railroads.

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?



SOME RECENT E. V. A. DOINGS

On January 15th, the Council of the Electric Vehicle Association of America held a meeting, those in attendance being John F. Gilchrist, president; Walter H. Johnson, vice-president; H. M. Edwards, treasurer; Frank W. Smith, Harvey Robinson, James H. McGraw, Charles Blizard, P. D. Waggoner, R. L. Lloyd, W. P. Kennedy, W. G. Bee, E. S. Mansfield, L. D. Gibbs, A. J. Marshall, secretary; and by invitation, Frank W. Frueauff, W. C. Andrews, and D. C. Fenner. The secretary reported on the general activities of the association, including a brief report of section activities, excerpts of which follow.

At the January 13th meeting of the Philadelphia Section, at the Hotel Colonnade, Frank B. Ruoff, of the General Electric Company, presented an illustrated talk on "Automobile Illumination," showing the stages of advancement of the electric lamp from its inception by Edison to the latest nitrogen-filled lamp. Views of the manufacture of tungsten were also shown. Incidentally, Mr. Ruoff brought out the fact that the present Mazda lamp gave 50,000 times as much light for a given amount of cost and energy as Mr. Edison's first practical incandescent lamp.

At the meeting of the New York City Section, an interesting card issued by the New York City Edison Company was referred to, from which we have taken some

"Don'ts for Winter Driving":

Don't try to accomplish as much in the snow as you have on clear asphalt.

Don't start out in the morning until you are satisfied that your battery has been fully charged.

Don't try to push a drift ahead of you. Leave it for the snow contractors.

Don't sit still while the wheels go around in the slush. Have a box of sand and a kitchen coal shovel handy. Use sand liberally. It is cheaper than electricity.

Don't throw your power on full. Work it up gradually, not forgetting the sandbox.

Don't forget an anti-skid device. An improvised one may be made by looping three or four turns of a rope around your tires.

Don't forget that time may be gained by leaving your wagon at the corner and making side-street deliveries on foot.

Don't let your truck stay out all night for want of a boost. The New York Edison Company has twenty-four charging stations in New York where your firm's credit is good.

The Washington Section held a meeting January 14th in the commercial office of the Potomac Electric Power Company. The

two papers presented were: "Automobiles in the Postal Service," by Mr. W. H. Haycock, Superintendent of Mails, Washington, D. C., and "Mine Haulage and Its Evolution," by Mr. A. H. Fay, Mining Engineer, United States Bureau of Mines.

The general office of the association is co-operating with the B. F. Goodrich Company in the preparation of a booklet on touring information of charging facilities available in cities and towns east of the Hudson River.

Realizing that electric vehicles are rarely, if ever, seen in motion picture production, so that the spectator thinks in only gasoline terms when motorized transportation is concerned, the general office has succeeded in having pleasure and business electrics used in films product on the coast.

INTERESTING OPERATING RECORD OF AN ELECTRIC TRUCK

An example of the successful operation of electric trucks in heavy hauling is given in the report of the Chief of Transportation of the Philadelphia Electric Company. On December 23rd this truck hauled five, heavy, 45-ft. poles for the Bell Telephone Company from the Philadelphia Electric Company's pole yard at Seventeenth and Sedgeley Avenue to Newtown Square, Pa.

"There is nothing remarkable," reads the chief's report, "in the statement as it stands, as we have made this trip frequently of late; but significance does lie in the fact that the trip was made by our No. 44 electric truck in the good time of 6¾ hours, leaving the pole yard at 6.30 a.m., and arriving at Newtown Square at 11.30 a.m., and arriving back at 1.15 p.m. after leaving Newtown at 11.45, making the total time for the round-trip 6¾ hours, and using 305 ampere hours.

The poles hauled were above the average size, the entire load approximating 8 tons, the capacity of the truck being 6 tons. This fact, together with the hilly country traveled, caused the truck to use in some places three times the amount of current ordinarily required. This was particularly noticeable in the run from Sixty-third and Market Streets to Llanerch, a distance of a little over 2 miles, taking one hour time and using 55 ampere hours.

"In addition to the above," continues the chief's report, "I desire to call your attention to the difference in the cost of hauling these poles by horse team. The cost of the trip made by No. 44 truck was 6¾ hours at \$1.50 per hour, or \$10.12; while the horse team took 20 hours at \$1.20 per hour, or \$24. It cost approximately \$14 more to haul by team than by electricity."



Beardsley Electric Truck

Furnished in one thousand and two thousand pound capacities. Could forty-cell battery; Westinghouse drum-type, four-speed controller; Westinghouse motor; worm-drive rear axle. The one-thousand pound chassis lists at \$1900; the two-thousand pound, \$2350. Built by the Beardsley Electric Company, Los Angeles, Cal.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

THE WAVERLEY ELECTRIC SHOP TRUCKS FOR GOVERNMENT USE

The Waverley Company, of Indianapolis, Ind., has under construction for the Navy Yard on Puget Sound, Washington, a three-ton electric shop truck with three-ton trailer for handling plates and angles from storage to machines and from machine to machine through the naval repair shop.

The tractor is of unusual design in that with a wheelbase of 66 in. the platform of the car is 5x11 ft., the principal overhang being in front of the front axle.

The battery of forty-two cells is divided between two battery boxes, one between the wheels and the other under the forward overhang.

Mounted on the platform of each car is a turntable 5 ft. 2 in. in diameter running on rollers and operated by hand spikes for the quick and convenient unloading of the heavy plates or beams it is designed to carry.

The construction of both cars is very substantial, wheels, axles, frames, turntables and all being of heavy steel. A single motor is used and the power is transmitted to the rear axle by means of a worm gear shaft drive.

A mileage of 30 miles on a single charge of the battery is provided and a speed of 5½ miles an hour with both cars fully loaded.

Storms Electric Car Company, temporarily located at 340 Gratiot Avenue, Detroit, Mich., is soon to place on the market electric pleasure and commercial cars. Officers are: William E. Storms, president; Ferdinand H. Zillsch, vice-president; F. T. King, secretary and treasurer. One standard chassis will be made to take three different bodies—coupe, roadster and delivery.

Dunlap Engineering Company, Parsons Avenue, Columbus, Ohio, is bringing out a 1000-lb. electric light delivery to sell at a low price.



Looks Like a Bad Case of Overload

But not so in reality. It's a GMC six-ton Electric fitted with a special body designed for hauling bales of cotton. The battery is located to the rear of the driver's seat, in the center.

A LARGE NUMBER OF DEALERS VS. BRANCH HOUSES



THIS is a theme of great importance. Truck manufacturers have given it serious consideration. And it is important because it is vital to the manufacturers.

Branch houses are an expensive experiment for the truck manufacturers, and as a result they are rapidly fading away. Successful manufacturers have long abandoned the idea or they never allowed this idea to strain their pocketbooks.

With branch houses the factory is required to maintain a very large sales force. This must all be watched and supervised at a considerable expense to the manufacturer. The branch has its manager, salesmen and sub-agents, all of whom must be paid and directed by the home office, besides the rental and other necessary expenses.

The responsibility of the manufacturer is very much greater when doing business through branch houses than through dealers, because the factory is really responsible for all the managers, salesmen and sub-agents say or do. Branch houses give a personal reflection on the factory. In other words, branch houses make the manufacturer directly responsible.

Now for a moment let us consider the cutting of prices in a branch house. If the men were all on a straight salary, then there would be no object for the branch to cut prices. But when the men are on a commission and salary they are more apt to cut the price. This is really demoralizing to business. Neither the manufacturer or the salesman get their share of the profit to which they are justly entitled.

But let us suppose both branch house and dealer did business on an equal footing. What would be the result? And to this it was the unanimous opinion among the persons interviewed by the writer that the dealer would show the greater results and at less expense.

The dealer in trucks is usually a live, energetic man of his respective town of which he is usually a native. A great many people know him, and as a result he has quite a following in trade. He is as a rule a man who has established himself in his respective community as a man of character, honesty, reliability, and besides he is in most instances a successful business man. One who has learned the rudiments of success.

A dealer always gets better results, and this is due to the fact that he has a special interest in the truck and truck business. He works with greater enthusiasm and energy than would a branch manager or branch salesmen or sub-agents because he (the dealer) has got to make good if he wishes to continue the agency for the truck and also to keep the wolf away from the door. A dealer will always make a greater effort to give better service than a branch house because his integrity, his character, his business, his all is at stake, not the machine.

Then again, the dealer is less apt to cut prices on trucks, because every time he does he injures himself just that much, not the manufacturer. He has to pay the manufacturer so much for the truck.

Instead of factories having to look after sub-agents and salesmen, the dealer assumes that responsibility. This makes him give closer attention to his business. He strains every nerve to make his sales corps proficient and economic in every particular as far as it is possible. Realizing the responsibility of his position in relation to the salesman, he insists upon getting results out of his men. Besides, he is close at hand and sees all that is going on, while the factory could not do that.



Electric Truck for Exposition Cash

To protect the cash taken in at the gates of the Exposition at San Diego, as well as the receipts from the various concessions, a thousand pound electric truck has been built to convey the coin to the city banks, for deposit. It is designed like a steel cage, with heavy mesh to render it bandit-proof, and, of course, a guard with a businesslike gun will accompany the treasure. Only three cars will be permitted to enter the fair grounds, of which this is one. The others are an ambulance and the roadster of the Director General; all electric, built in Los Angeles.

The CCJ has most readers because it gives most information

Motor Truck Design

By CORNELIUS T. MYERS

TO BE efficient—and by that I mean the overall efficiency that insures long life and low cost of repair—motor trucks must be simple in design, rugged in construction, and all parts must be easily accessible and readily removable. Simplicity should be the keystone of the tune hummed over the drawing boards.

I was once looking over some well kept motor trucks in a big garage, and with me was a young man who had had no experience with motor trucks, although he had "burned up" many a tire casing. The man in charge of the garage lifted the hood sides, the trap door in the body, and the foot boards. They revealed wires, rods, levers, pipes, etc., running in all directions and filling every available corner; the magneto and carburetor were surrounded in a manner that would cause the maximum amount of cursing when any adjustment or cleaning became necessary; the oiling and ignition systems could be touched only after carefully consulting diagrams, and they were not lightly tampered with; part was built on part in confusion and congestion. The youth was impressed with the "extras" which were evident, and he remarked on the completeness of the equipment of each truck. "Uh, uh," said the man in charge, "each one of 'em is fitted up like a medicine chest, guaranteed to cure anything a truck oughtn't to be."

Simplicity can only be attained by a clear realization of the problems met in motor truck design and a correct application of the principles of mechanical construction; and I think the most important point to be kept in mind when designing (and in buying) is that of the effect of the uneven roadbed on the flexible frame of the truck, and the stresses which can be set up in the various parts which are mounted on it. In proportion to the loads carried, motor truck frames are not nearly so stiff as pleasure car frames, and the motor truck frame distorts more as the wheels pass over an unevenly surfaced road or street. If one wheel rides up on an unusually high spot or drops into a hole, the heavy load on the frame forces one corner to follow the rise or fall of that wheel while the other corners of the frame remain practically at their normal levels. Uneven loading is also a cause of frame distortion. This distortion is constantly taking place in a greater or less degree at all points of the frame when the motor truck is in motion, and to the accompaniment of a road vibration that searches out and plays havoc with parts on poorly designed mountings. The radiator, motor, steering gear, gear-box and every other part must be so supported that frame distortion by the road or load sets up no stresses in these parts or their mountings. The wheels, axles, springs, frame, and body are the load carrying members of the assembly and can be designed accurately for known conditions. Practically all the other parts of the motor truck have other functions to perform—to give motion to the truck, to control it and to check it. To

perform best they must be unhampered in any way by road or load strains, and this is most particularly true of the motor itself.

Back in fondly remembered days we learned that "any three points will determine the location of a plane," a theorem nowhere more applicable than in motor truck design. To bolt a motor or a gear-box solidly at four or more points to the two sides or to two cross-members of the continuously distorting frame is little less than a mechanical crime. Modifications of design wherein these parts are similarly mounted on a sub-frame firmly connected to the main frame are almost equally fatal to the parts so mounted or to the sub-frame—the parts matching their strength against that of the sub-frame. When fastened at four or more points and frame distortion takes place some part of the crank-case or gear-box is strained out of position, cramping bearings and shafts, causing disalignment, excessive friction and wear. With these parts suspended at three points and the details of the suspension properly designed, nothing of the kind is possible, because, no matter what the motion of any one of the points of suspension, it is still in a plane containing the other two points of suspension, and the castings on which these points are located will not be warped. The old illustration of the four-legged versus the three-legged stool is quite applicable to the case at hand if we imagine the legs in each case to be fastened to a floor which is constantly being warped into various waving shapes by some action from below. The four-legged stool will soon be loose in every joint, whereas the three-legged stool will remain as stiff as ever. Go further and imagine the legs, bars and seat all hollow and containing closely fitted mechanisms—what must ultimately happen to the mechanism in the four-legged stool?

Any kind of a three-point suspension will not do, however, in motor truck design; for instead of being merely points there are surfaces of considerable area to consider at each so-called "point." The changing position of these surfaces must be allowed for. Under some conditions of frame distortion the distances between the three points selected on the frame vary from the similar distances when the frame is in normal position—of this we must not lose sight. A well-known construction is that where two arms at the rear of the motor crank-case rest on ball-and-socket washers, hardened and ground. These in turn rest on brackets fastened to the frame. A single bolt extends through the motor arm, the washers and the bracket, all of which have clearance holes for this bolt. Between the nut on this bolt and the bracket through which the bolt passes is a coil spring which will safeguard the bolt, bracket and motor arm from any excessive stress due to extreme frame distortion. The third "point" is a ball through which passes the starting crank housing. This ball can turn in a socket bracket which is supported in the front cross member, and the starting crank housing is free to reciprocate in the ball.

A motor suspension which the writer has

used with marked success is one where the two arms from the rear of the motor crank-case are supported by saddle shaped brackets fastened to the side members of the frame. Between the motor arms and the brackets are blocks of wood which act as cushion washers. These blocks, from 1 in. to 2 in. thick, allow a certain amount of local compression by one side or the other of the motor arms as they rock on the blocks during frame distortion. A single bolt passes through each motor arm, wood block and bracket, and is secured on the lower side of the bracket by a castellated nut over a heavy spring washer. The front support—the third "point"—is a cast-iron sleeve bracket which surrounds the housing for the starting crank. This bracket is fastened by two bolts to the top of the front cross-member of the frame, which is "dropped" to allow it. Between the front bracket and the cross-member is a block of wood, serving a purpose similar to that of the blocks under the arms at the rear of the motor crank-case. The starting crank housing is free to turn and to slide in the sleeve bracket, and the wood block takes up the slight tendency of this bracket to rock back or forward on the front cross-member under the influence of frame distortion. This mounting successfully relieves the motor crank-case of the stresses it is necessary to avoid, it is simple, and it is inexpensive. It has the further advantage of affording plenty of space at the sides of the motor, giving ample wrench room around the carburetor and other attachments. It also fulfills the requirement of easy demountability for the motor, for by withdrawing the four holding-down bolts it can be lifted (the hood and radiator having been removed) and swung clear of the chassis. The wood blocks, too, act as absorbers of road vibration to no small extent, and they are an easy means of adjustment for the alignment when the motor is being mounted in the frame.

Any wheel of a motor truck having a motor so mounted can be raised or depressed a very considerable amount (as much as would ever be encountered in service) from the level of the other three wheels, and the crank-case will not be stressed or distorted. Furthermore, the motor is free to deliver its full torque to the transmission system. Many a motor truck is carrying a motor larger than necessary because a smaller motor, improperly mounted, would not pull the truck through the mud-holes and sandy stretches ordinarily encountered on trial runs. It could not on account of the excessive friction within itself, set up by the cause mentioned above, at a time when it could least be tolerated. When one realizes that a larger motor entails a larger radiator, heavier gear-box, stronger transmission system, and increased weight in many other parts, it will readily be appreciated how important a feature is this one of support. And in addition to saving weight, first cost and operating expense, the properly mounted smaller motor will perform better, last longer and require less repairs than the improperly mounted larger motor.

TALKS ON MOTOR TRUCK SITUATION, WITH TWO OF BOSTON'S PROMINENT TRUCK MEN

By J. J. SULLIVAN



THE motto at the head of the bulletin board in the salesroom of Boston's largest automobile dealer seems to reflect the spirit of what has entered into the motor truck outlook for 1915. It is "Optimism: Why Not?"

Mr. Cunningham, in charge of the truck department of J. N. McGuire Company, Boston and Eastern Massachusetts agent for the Pierce-Arrow trucks, thinks that the new year will show a big improvement in the truck situation and will be a profitable year for all financially responsible truck dealers and manufacturers.

In speaking of his companies in regard to sales of trucks, he says they have discontinued all demonstrations; in fact, at the present time they have not a truck for demonstration purposes and have recently ceased to operate a service car. He could recall but one sale that he could trace directly to a demonstration.

If a prospect suggests a demonstration he tells them he cannot give a demonstration, but can do better by them. He will take them to any of his customers in the same line of business and let them hear from one having experience with the truck just what it is doing for him.

A Unique Service Plan

The fact that he has disposed of his service car does not mean that his customers are left entirely on their own resources; they are looked after by a method that would seem to be a new idea as regards service, and he says it meets with the approval of his customers, and in fact some of them consider it very highly.

He has sold trucks to men who make a business of looking after the requirements of truck owners whose equipment from one cause or another is out of commission or disabled on the road. When an emergency call for a truck comes in these people are notified and a truck is immediately dispatched to take the place of the disabled truck, and charges are made by the people owning the relief truck. In case trouble is due to a defect in the truck, adjustments are made with the owner. This saves a large overhead expense, and, as the dealer is in a position to meet all demands of his customers, they like the plan.

He has, of course, inspectors to go and look over trucks to see that they are kept in condition, and no charge is made for these inspectors, except in the case of very old cars, when inspections are made with a view of making repairs.

Asked what he thought of the idea of a motor truck club for Boston, he considered it a very good thing, but did not consider New England quite ready until there was a little more co-operation among the dealers.

Mr. Cunningham says he thinks the second-hand problem is injuring the business to some extent, in that a man, considering the advantage of the motor truck for his business, sees that he can get a second-

hand truck at such a reduced price that he will buy one as an experiment. He buys one, and, of course, it falls down on him and he immediately condemns the truck business, without considering his short-sighted method of experimenting.

The Boston manager for another of the big dealers, handling trucks exclusively, gives interesting views on the motor truck outlook.

He says the year 1915 promises the year that the motor truck industry has not yet seen, but it will be a case of the "survival of the fittest." The new companies with small capital will be unable to carry on the business and responsible companies of known financial standing will get the business. At the present he says there is more money being spent in this country than at any time in its history, and if business was not improving rapidly this would not be the case.

Another Case of No Demonstration

His company has also cut out demonstrations except in rare cases where the prospect is in remote sections, where it is difficult to put him in touch with users of his trucks. A charge is made for the demonstration, with the understanding that the money will be refunded if a truck is purchased. He has not made one sale, he says, that was due to a demonstration. When a demonstration was mentioned, he said, you should say (demon)stration, as that is how we now regard the word.

If a prospect is mechanically inclined, he shows him the mechanical features of his truck, bringing out the strong points and showing how they will fit his requirement and proving the responsibility of his company. He figures that this, with the work his truck is doing for others in the same business, is more satisfactory than taking out and doing with his truck what any good truck of standard make will do.

His views are that, at the present time, the motor truck industry is reduced to a scientific basis and is entirely a twentieth century proposition. In the past, he says, sales managers from other lines of business were placed in charge of truck sales and methods of sales and promises of salesmen had led customers to expect that when a truck was purchased, everything else was free.

At present the truck sales are handled by men who grew up with the business and have a thorough knowledge of what the truck is capable of doing, and, if the prospect is willing to let them look over his requirements, they will tell him just what the truck will do for his business, especially showing the economy over horse equipment if his business requires the truck.

In speaking of a motor truck club for Boston, he thinks it is just what is needed to educate the business men and prospects to the value of the truck.

It would also result in an improvement among the drivers, he says. When the employer is familiar with how the truck should be handled through the co-operation of the dealers, he will see to it that the driver takes proper care of his truck.

The driver, he says, is the greatest problem they have to contend with, and the truck is no better than the man on the seat.

DETROIT'S CRIPPLED CHILDREN TAKEN TO AND FROM SCHOOL IN AUTOS

Commissioner John Gillespie has found a new use for the motor patrols of the Detroit police department during their idle hours, which in the case of the outlying stations are more or less numerous. The city maintains a school for crippled children, and the patrols are employed in taking the unfortunates there in the morning and home at the close of the session, a mid-day meal being served in the class-



Detroit Police Patrol Carrying Crippled Children From School

rooms. Every station in the city has a motor patrol. Each of these, with the driver and a signal officer aboard, leaves its precinct station in time to call for the first passenger at 7.30 a.m. It is due at the school an hour later. The performance is reversed in the afternoon, and the total ambulance service averages about 15 hours a day, according to Secretary George Walters. The secretary also figures that during the school year something like 30,000 miles will be covered by the patrols in this service. During the winter months plenty of warm blankets are provided for the children, and everything is done for their comfort, the policemen lifting them into and out of the machines, when necessary. During the time the patrols are engaged in this service the identity of their more prosaic task is concealed by a removable sign which reads, "School Ambulance."

The Weber-Bunks-Lange Coal Company, New York City, has displaced eight of its horses with a five-ton Pierce-Arrow truck. It is the expectation of the company to shortly own a five-ton Sauer truck.

The Board of Public Safety, of Louisville, Ky., in its annual report, recommends the displacing of horses for motor apparatus in the police and fire departments, as soon as the financial condition of the city permits.

Salt Lake Livery & Transfer Company, 32 S. W. Temple Street, Salt Lake City, Utah, formerly owned by P. W. & R. W. Madson and Will Armstrong, has been taken over by L. S. Mariger and associates. The stables are to be remodeled and a new garage erected. All motor equipment will be installed to take the place of the present horses.

W. L. Herbert & Co., New York City, have been able to reduce their coal hauling costs 15 per cent. by using a fleet of six and a half ton Commerce wagons. The company has designed its own bodies to meet the conditions peculiar to its needs. These are set up higher on the chassis than the ordinary coal body and are constructed so as to feed all of the coal to the side chute by gravity, without the assistance of the shovel or broom.

Horns for the Commercial Car

AS A rule, the truck operator considers the horn on his machine a useless appendage, and in many instances its whereabouts are forgotten entirely. Many operators depend upon the muffler cut-out as a suitable means of attracting the pedestrians' attention, while others are willing to take a chance.

Within the past year most of the large cities have passed ordinances requiring all motor propelled vehicles to sound a warning when passing street crossings or when approaching other vehicles, etc., and in the majority of cities these ordinances are strictly enforced. In the past the horn maker confined his efforts principally to pleasure car horns, which, when used on commercial cars, shod with hard rubber tires, soon broke to pieces. Many of these same concerns have realized the necessity of a substantially built truck horn, and, with the advent of the hand operated mechanical horn, many new truck horns have made their appearance.

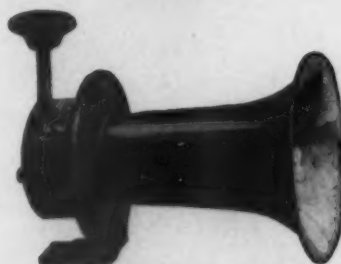
The object of this article is to acquaint our readers with the many makes of mechanical, electrical and exhaust horns now on the market and which are either designed especially for commercial car service or suitable thereto. For easy comparison we have divided them in three classes in these columns.

The hand operated mechanical horns are practically the most numerous and, due to their simplicity of design and fool proofness, are very well adapted to strenuous service. Next in line are the electrical horns, comprising both the motor driven and vibrator type. Where a storage battery is used for ignition this type of horn can easily be installed and without expense. The electric horn, of course, is very convenient to operate—the push button being placed on the steering wheel rim or the driver's seat.

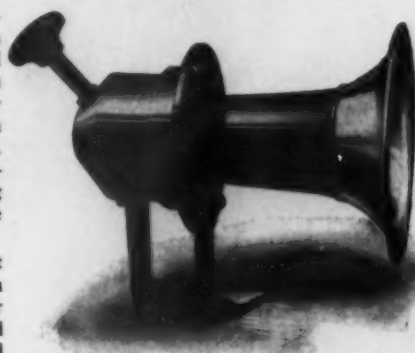
The next classification includes exhaust horns, which are usually operated by a pedal on the floor board. These horns or whistles are generally attached to the end of the muffler pipe outlet, and are connected to the pedal by a cable or chain.



The "Claro" Model A, \$5
Fitzgerald Manufacturing Company,
Torrington, Conn.



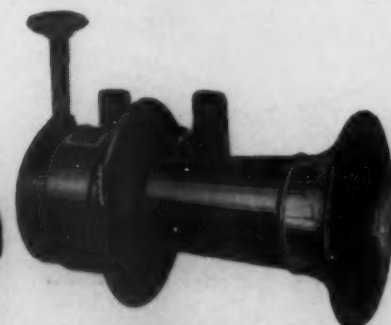
"Long" Horn, Model J, \$5
H. W. Johns-Manville Company



"Garford", \$4.25
Garford Manufacturing Company, Elyria, Ohio



"Double Warning" Horns
Upper, \$6.50; lower, \$5.
Talking Horn Company, Inc.,
Middletown, N. Y.



Stewart Warning Signal, \$5
Stewart-Warner Speedometer Corporation, Chicago



"Boyce" Hand Horn, \$10
Boyce Company, 1790 Broadway, N. Y.

The Adams-Bagnall Electric Company, Cleveland, Ohio, offers a motor-driven and a vibrator type horn. The motor type contains a very simple motor, as will be noted from the illustration, which shows the cover removed. A constructional feature of this horn is that the commutator can easily be cleaned with sandpaper while the motor is running. Spiral copper brushes are used to prevent an insulating film from forming on the commutator.

The vibrator type horn is very accurately made and is fitted with large silver contact rivets, which practically eliminate adjustment.

Raymond C. Agner Company, Burlington, Wis., makes the Simplex Exhaust Whistle which will operate on any size motor and is recommended for fire department and patrol use. Price \$3.50.

The American Electric Company, 64th and State Streets, Chicago, makes a very novel vibrator type horn, catalogued as No. 17, and listing at \$3.75. This horn is designed especially for truck service, being made without a bell or projector. A unique feature of this horn is the making of the mechanism case as one unit and the front with diaphragm and back as a separate unite.

A hand horn is also made by this company, known as the No. 35 "Sampson Tiger" and which lists at \$5. It operates easily by turning of handle, forward and back. The tone varies with the speed.

The Automobile Supply Manufacturing Company, 220 Taaffe Place, Brooklyn, N. Y., makes the Handphone, a very substantially built hand-operated horn, listing at \$6. It also lists a reasonably-priced electric motor-driven horn, which is said to give a great volume of sound with a minimum of current consumption. Price \$8.

Barco Brass and Joint Company, 212-22 West Illinois street, Chicago, Ill., makes the Barco Chime in two sizes, No. 1, 2 1/4 x 14 1/2 in.; No. 2, 2 x 11 1/2 in. This lists at \$7 to \$12, according to the size of valve. The chime is made of brass with an aluminum core. A feature of this concern's outfit is the valve, which allows an absolutely unobstructed passage when the valve is open.

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?



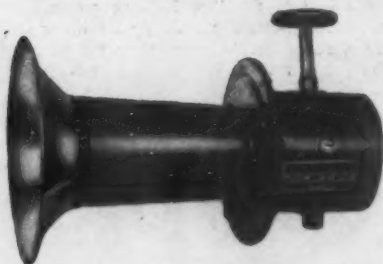
"Safeguard", \$5
Duplex Electric Manufacturing Company,
Pittsburgh, Pa.



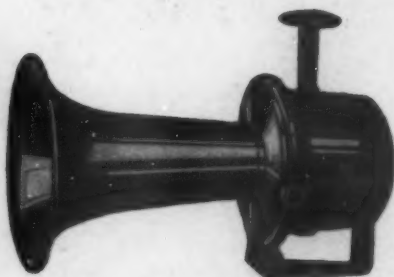
"Spartan" Model F, \$4.25
Sparks-Withington Company, Jackson, Mich.



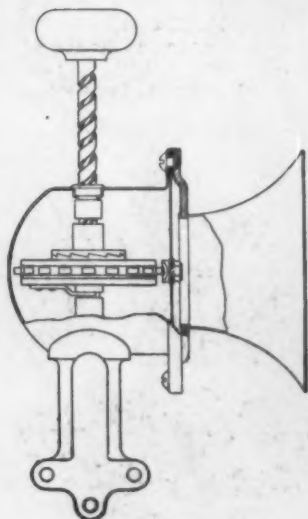
"Nonpareil" Model B, \$6
Nonpareil Horn Manufacturing Company
73-75 Wooster Street, N. Y. City



"New Era", \$5
New Era Spring & Specialty Company,
Detroit, Mich.



The "Peerless", \$3.95
Peerless Auto Horn, 30-32 N. Dearborn
Street, Chicago



The Heco Horn, \$4
Heinz Electric Company, Lowell, Mass.



"Handphone", \$6
Automobile Supply Manufacturing Company,
Brooklyn, N. Y.



"Samson Tiger", \$5
American Electric Company, Chicago

The Benjamin Electric Manufacturing Company, 114 Liberty street, New York City, is manufacturing two styles of truck horns, listing at \$4 and \$6 respectively. The \$4 horn, Model D, has a steel body and projector, black enamel finish.

The \$5, Model G, horn is of the under-hood type, steel projector, black enamel finish. These horns are sold with a five-year guarantee. Among their features may be mentioned a laminated magnet; shallow case; Swedish spring steel diaphragm, mounted between cork felt washers.

The Boyce Company, of 1790 Broadway, New York City, also makes a novel hand operated horn, which is different from the usual plunger type construction, it being operated by turning a knurled case at the back of the horn either to the right or left; producing a soft tone when the case is gently turned, while a sharp blast is emitted when the case is given a violent turn. The finish is in black and nickel. Price, \$10.

The Buell Manufacturing Company, 1142 E. 46th Street, Chicago, is manufacturing a warning signal known as the Buell Explosion Whistle. The whistle is not exhaust operated but is installed on the cylinder head in place of one of the priming cups. The valve used is a miniature poppet valve $\frac{1}{2}$ in. in diameter. It is ground to a compression tight fit with its seat, and, owing to the small amount of the heated gas which passes through it, its life will exceed that of several cars. One of the many points in favor of the outfit is its absolute freedom from trouble and any need of attention. The control on the poppet valve is quite sensitive, and owing to the high pressure at his command, the driver can sound a very light or very powerful note as conditions may require.

The amount of power required to blow the whistle is negligible, a small motorcycle engine blowing it without serious loss. The whistle proper is made in two models; a single-tone and a three-tone chime. Both are made of aluminum in a one piece casting. The single tone is 2 in. in diameter and $4\frac{1}{2}$ in. long. The complete outfit weighs but 10 ounces. Prices are \$4.25 and \$6.

The Dudley Tool Company, of Menominee, Mich., makes the Dudley horn, of motor-driven type. The mechanism is very simple. Special attention is given to the method of mounting the diaphragm button. The button is a tool-steel stud screwed into a cold rolled piece of steel, which in turn is riveted to the diaphragm. The ratchet is also of tool steel and works directly against the tool-steel stud. The horn is finished in all black enamel and also with nickel-plated bell.

The Duplex Electric Manufacturing Company, of Pittsburgh, Pa., makes a hand horn, listing at \$5. It is simple in construction, while all gears and wearing parts are made of heat-treated tool steel. Standard finishes.

This company's motor-driven electric horn lists at \$10 complete. The essential feature of it is the rotor and free moving ball, which eliminates friction and reduces current consumption.

The Fulton Company, 726 National Avenue, Milwaukee, Wis., makes the "Aermore," which produces a loud, penetrating, musical tone, even with a weak exhaust. The tubes are of brass, heavily nickel-plated with a solid steel core and malleable iron fitting. Price, with valve, pedal, cable and pulley, is \$5.50 for Ford size; \$6.50 and \$7.50 for larger sizes.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers



"A-B", Vibrator Type, \$5
Adams-Bagnall Electric Company, Cleveland, Ohio



"New Era" (Motor-Driven), \$6
New Era Spring & Specialty Company,
Detroit, Mich.



"A-B" (Motor-Driven), \$10
Adams-Bagnall Electric Company, Cleveland, Ohio

The Fitzgerald Manufacturing Company, of Torrington, Conn., lists a mechanical horn, Model A, Long Bell horn, at \$5, in all standard finishes. The mechanism is very simple. Pressure on the plunger operates a ratchet wheel, driven by a spiral. The ratchet wheel strikes directly against a button in the center of the diaphragm. The mechanism is all enclosed and fool proof, and only requires oiling occasionally.

This company also offers a hammer-blow electric horn listed at \$4, known as the Clero Junior; also the Clero Bulldog at \$3.

The Garford Manufacturing Company, Elyria, Ohio, features a hand horn at \$4.25. The interior mechanism is unusual. There is one shaft, upon which is mounted the cam wheel, and this shaft is actuated directly through a chain, which is fastened to the plunger. The chain is solid link type, similar to a bicycle chain, and is so designed to drive the cam wheel when the plunger is depressed and to slide freely when the plunger is released.

The Garford "Rexo IV" is a vibrator type horn, made in two models, one for outside mounting, finished in baked black enamel, with nickel finished bell, and the other, underhood type, with solid black enamel, with projector designed to get the full effect of the warning note, regardless of the enclosed position. It lists at \$3.85.

Theo. H. Gary Company, 67-69 Irving Place, New York City, sell an attachment with which any standard type of bulb horn can be transformed into an electric one. The attachment is 3 1/4 in. in diameter, 3 in. long, and can be attached to any horn. Price of attachment is \$15.

The Heinze Electric Company, Lowell, Mass., has just brought out a mechanical hand operated horn which embodies a unique principle which makes it the only horn of its kind on the market. Pressure on the spiral plunger engages a ratchet clutch, and, when pressed down, turns the rotor which is made of steel hammers that

fly out by centrifugal force, and whirl against the steel diaphragm or sounding board. These hammers strike the sounding board a series of rapid blows, and, if any wear should occur, it is provided for by the loose hammers, which would take up any wear without affecting the sound or working of the horn. The hammers and diaphragm are made of hardened tool steel.

The Hipwell Manufacturing Company, of Pittsburgh, Pa., calls attention to its "Auto-phone" which gives a peculiar penetrating signal. By the use of a strong electro magneto a small pin is made to strike a powerful diaphragm which is housed in a horn of solid-drawn brass. Price is \$5, including necessary wiring and push button.

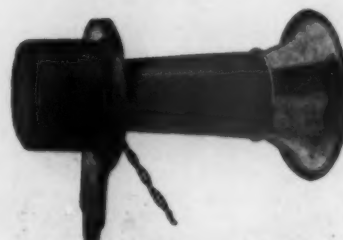
The H. W. Johns-Manville Company, New York City, offers the well-known Long Horn, the pioneers of the hand-operated type of warning signal. The projector is made of one piece, seamless. The vibrator is mounted on a ball bearing. Price is \$5.

The Manhattan Electrical Supply Company, 17 Park Place, New York City, offers the "Mesco," which is a very sturdily built horn, and being made of heavy cast and wrought brass will withstand hard usage.

The Nonpareil Horn Mfg. Company, 73-75 Wooster Street, New York City, manufactures two horns suitable for truck use—namely, an electric warning signal with self-adjusting vibrator at \$5, and a hand-operated mechanical horn at \$6. The electric horn is fitted with a steel vibrator having double contact points so it can be reversed. This company also makes a line of bulb horns at various prices.



"Dudly" (Motor-Driven), \$8
Dudly Tool Company, Menominee, Mich.



"Nonpareil" Vibrator Horn, \$5
Nonpareil Horn Manufacturing Company,
73-75 Wooster Street, N. Y. City



"Clero Junior", \$4



"Mesco" Signal Horn, \$15
Manhattan Electric Supply Company,
17 Park Place, N. Y.



"Clero Bulldog", \$3
Fitzgerald Manufacturing Company,
Torrington, Conn.



"Safeguard" Model B (Motor-Driven), \$10
Duplex Electric Manufacturing Company,
Pittsburgh, Pa.

The CCJ has most readers because it gives most information



"Benjamin", Model F, \$6
Benjamin Electric Manufacturing Company,
N. Y. City

Minerva Hardware Manufacturing Company, Minerva, Ohio, makes three sizes of exhaust horns, listing at \$4, \$5 and \$7. A special Ford model lists at \$3.50.

The Oakes Company, Indianapolis, Ind., makes the Beartone fan horn, which is a combination fan and horn. Instead of a revolving ratchet and a stationary diaphragm the Beartone has a stationary ratchet and a revolving diaphragm. The Beartone can be interchanged with the fan on the truck, it only being necessary to remove the present fan and slip the Beartone in its place. A push button on the foot board or any other convenient place pulls a cable that pulls a lever on the fan. Price is \$7.

The Peerless Auto Horn, 30-32 N. Dearborn Street, Chicago, offers the Peerless at \$3.95. It is fitted with a 4-in. corrugated diaphragm, has 6-in. projector, and measures 9 in. over all.

The Randall-Faichney Company, Boston, Mass., manufactures the "Jericho" one-tone horn, which has been a standard product with this company for a number of years. The horn is also made in a Ford size at \$3.50.

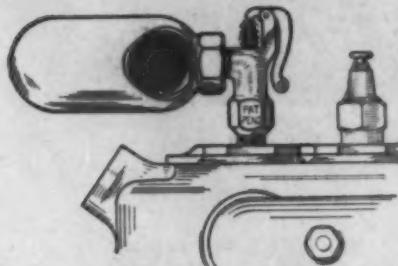
The Riley-Klotz Manufacturing Company, 17-19 Mulberry street, Newark, N. J., makes a complete line of bulb horns for trucks, also the Arkay electric vibrator horn.



"Ka-Ha-Co", Vibrator Type, \$6
The Kales-Haskel Company, Detroit, Mich.



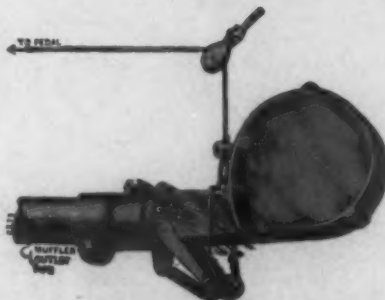
Garford "Rezo IV" (Vibrator Type), \$3.85
Garford Manufacturing Company, Elyria, Ohio



"Buell" Whistle, \$4.25 and \$6
Operated by the explosion of the motor. Buell Manufacturing Company, 1142 E. Forty-sixth Street, Chicago.



The "Beartone" Fan Horn, \$7
The Oakes Company, Indianapolis, Ind.



"Jericho", Prices \$5, \$6 and \$7
Randall-Faichney Company, Boston, Mass.



"Hipwell Auto-Phone", \$5
Hipwell Manufacturing Company, 831-35 North Avenue, Pittsburgh, Pa.



The "Sireno" Junior, \$25
The Sireno Company, 18-20 Rose Street, N. Y. City

The Sireno Company, 18-20 Rose Street, New York City, offers the Sireno Jr., which is designed for high priced trucks. The Sireno is fitted with an invisible magnetic brake within the motor, making the instrument very flexible. It enables the operator to produce a short, quick blast, or a long sustained note. This horn is claimed to be very economical in current consumption as the only friction to overcome is that of the air and two sets of ball-bearings, which carry the rapidly revolving aluminum fan and motor armature. It operates from 6 or 8 volt storage battery.

The Standard Motor Parts Manufacturing Company, 1200 Chestnut Street, Philadelphia, Pa., catalogs the Red Devil exhaust horn, made in three sizes, listing at \$5, \$6 and \$7. It has four brass tubes and is attached to the end of the exhaust pipe.

The Sparks - Withington Company, Jackson, Mich., offers a hand operated horn which is exceptionally well made. It measures 10 1/4 in. in length, while the bell is 5 1/4 in. in diameter. Price, \$4.25.



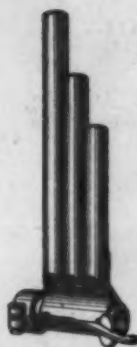
The Crack-Unicum Electric Horn Attachment, \$15

For attachment to any standard make of bulb horn. Theo. H. Gary Company, 67-69 Irving Place, N. Y.



"Newton Superior" (Motor-Driven), \$8
Automobile Supply Manufacturing Company, Brooklyn, N. Y.

The CCJ has most advertisers because it gives them biggest returns

**"Minerva", \$4**

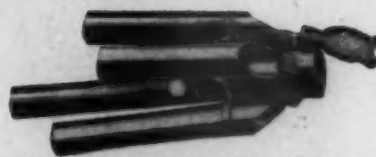
Minerva Hardware Manufacturing Company Minerva, Ohio.

**"Simplex" Whistle, \$3.50**

Raymond C. Agner Company, Burlington, Wis.

**The "Aermore", \$5.50, \$6.50 and \$7.50**

The Fulton Company, Milwaukee, Wis.

**"Red Devil", \$5, \$6 and \$7**

Standard Motor Parts Manufacturing Company, 1200 Chestnut Street, Philadelphia, Pa.

**"Barco" Chime, \$7 to \$12**

Barco Brass & Joint Company, Chicago, Ill.

The Stewart-Warner Speedometer Corp., Chicago, has recently gotten out a special truck model of its Stewart hand horn, having a bracket so arranged that it may be adjusted to three angles. It is heavier in construction than the pleasure car model. The drive is of the ratchet type, all gears

being case hardened. The gear shafts run in steel bushings. Price is \$5.

The Talking Horn Company, Inc., Middletown, N. Y., offers a horn which is novel in its mode of operation. It is made in two sizes, retailing at \$5 and \$6.50. This horn is operated by pulling a strap, which is auto-

matically drawn into the case upon being released, repeating the first warning with a louder effect. This horn is guaranteed not to be affected by the changes in weather, and, owing to the fact that the vibration of the car has no effect upon it, is particularly adapted for use on motor trucks.

EXPERIENCE OF THE ST. LOUIS POST-DISPATCH, OF ST. LOUIS, WITH MOTOR DELIVERY



AUTOMOBILES first displaced horse-drawn vehicles in the delivery of the St. Louis Post-Dispatch to its branches in December, 1907, but these machines, all of one make and built to haul 1500 lbs., were soon found to be unsuited to its needs, and in the following July were in turn displaced by one-horse wagons.

It was not the opinion of the Post-Dispatch that auto delivery was a failure, but that this particular car was unsuited to the exacting requirements of a newspaper.

It was the opinion of the Post-Dispatch at the end of its 6 months' initial auto experience that the main cause for failure of its first experiment should most certainly be laid to hard tires. Solid tires on machines having to make time-card schedules, and being obliged to cover the most poorly, instead of the best paved streets, was the prime cause of the defeat of the plan.

Cars thus equipped were shattered to pieces in a surprisingly short time.

Only a few months elapsed before the Post-Dispatch, anxious to improve its delivery system, was again experimenting, but this time with only one machine.

Later still another machine (a Dorris car) was added to the equipment.

Here at least was a car with a pneumatic tire. The first year's showing of this tire was so nearly satisfactory that another was added, and later more of them, and now seven Dorris cars are in daily use by the St. Louis Post-Dispatch.

The tire cost is an important item, but with pneumatic tires there are no calls for relief—no broken axles, springs, steering rods and so on. Delivery is made without a hitch.

At the beginning of the year 1913 two Dorris cars were in commission. By the middle of June this number had been raised

to five. Shortly after the fifth car was put into service, the oldest car, which had covered 23,000 miles, was sent to the shop for an overhauling, where it remained 23 days. A little later another car, as a result of a collision, was laid up for 16 days. Another car lost 4 days and still another 14 days.

Therefore, the loss of time was equivalent to one car for 57 days out of a total of 1434 days. This loss of service represents a trifle under 4 per cent.

During 1913 these cars traveled a total of 81,069 miles. One of them averaged 53.8 miles daily. This was the lowest. The highest average was 63.5. The records for 1913 show that the average number of miles per gallon of gasoline was 9.8.

Total cost of maintenance and operation (chauffeur included) was a shade over \$1.17 a mile (to be exact, 17 8/100), and this

takes everything into consideration—the period for theorizing having passed prior to the experience of 1913. The daily average total cost per car was \$9.94.

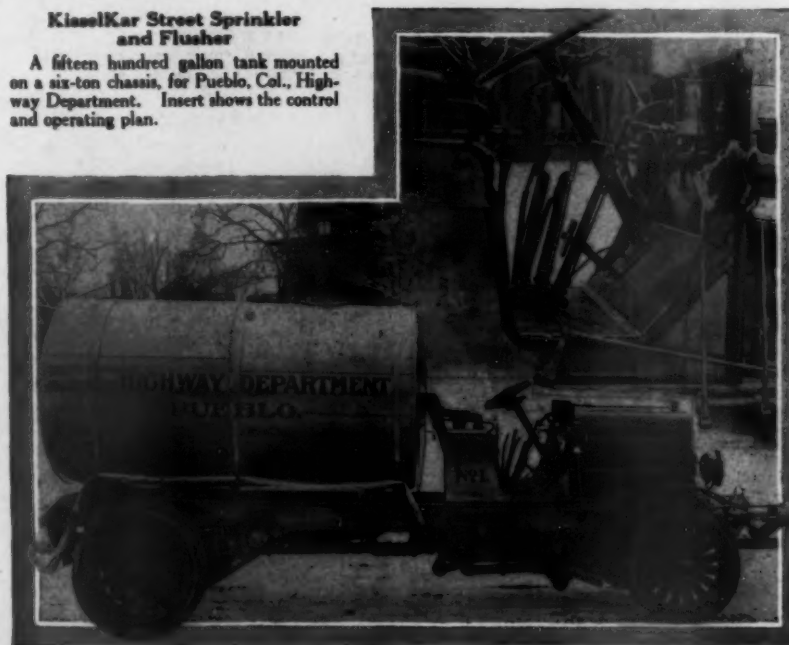
The oldest car in service, up to the first day of October, 1914, had traveled a total of 56,064 miles with only one period in the shop to mar its record.

Each machine thus far installed has displaced three one-horse wagons.

The General Asbestos & Rubber Company, which has two factories in Charleston, S. C., has decided to locate a large plant in North Charleston at the cost of \$175,000. The machinery now in use will be moved to the new plant and new machinery installed. The old plant will be abandoned upon completion of the new one. The offices of the company will remain at present site on Cumberland Street.

KieselKar Street Sprinkler and Flusher

A fifteen hundred gallon tank mounted on a six-ton chassis, for Pueblo, Col., Highway Department. Insert shows the control and operating plan.



The CCJ leads in circulation, advertising and prestige

Activities of the Motor Truck Association of Philadelphia

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COMMERCIAL CAR JOURNAL OFFICIAL ORGAN

The monthly meeting and dinner of the Motor Truck Association of Philadelphia was held on Wednesday evening, January 20th, in the Winter Garden of the Adelphia Hotel, Vice-President E. S. Hare presiding.

After dinner, Judge Eugene C. Bonniwell was introduced as a speaker of the evening, who addressed the members on the lighter and humorous side of the affairs of the Domestic Relations Department of the Municipal Court of Philadelphia and the many funny instances that were brought out by the judge were greatly appreciated by the members present.

During the business session interesting discussions were heard on a paper read by Mr. E. S. Hare at a recent meeting of the association. Methods of selling motor

trucks and the possible increase of business from users' point of view were brought out forcibly by Mr. Raynesford, of the Packard Motor Car Company, and Mr. Cooper, of the International Motors Company.

Mr. Woodruff, of Strawbridge & Clothier, spoke about the increasing necessity of using motor trucks owing to the high cost of feeding and properly caring for delivery horses.

Mr. E. J. Hancock, of the Curtis Publishing Company, told how the merchants who use power vehicles would welcome any assistance that the Motor Truck Association could give them to show the motor truck users the proper method of handling motor trucks. This subject was also

touched upon by Mr. E. B. Jackson, of the Packard Motor Car Company, president of the association, and by Thomas K. Quirk, H. Kaiser & Company.

Other speakers of the evening included Mr. O. W. Doolittle, of the Foss-Hughes Company; Mr. F. M. Wright, of the Knox Motors Company, and Mr. W. H. Metcalf, of the Bartlett Garages, Inc.

Mr. E. J. Cattell, City statistician, who is an honorary member of the association, concluded the program with one of his famous humorous-optimistic speeches.

The association is growing very rapidly and every motor truck man, tire man and body builders are very active in the development of the association.

Don't Make the Mistake of Selling Him Too Large a Truck

By LEN G. SHAW

"In the early days of the business the chief mistake made by salesmen was in loading a man up with a truck when his business would not warrant such a move, and consequently converting him into a knocker of the first magnitude. Now the error most frequently committed is in providing the wrong installation—the sort of equipment that is not best adapted to the individual requirements of the purchaser."

Thus the manager of a big truck selling agency and service station summed up the situation as it appeared to him. Then he proceeded to elucidate.

"There are two reasons why the old order of things has all but disappeared," he said. "In the first place, the fellows are more cautious. It is no longer a case of placing a machine regardless. Satisfaction must be reasonably certain on the part of the buyer, or the deal might better not go through. Then, too, the public is motor wise, and the average business man knows whether his concern is ripe for service of this nature."

"Where he does lack information is with regard to the truck best suited to his purposes, and here is the salesman's opportunity to make a friend by deciding for the prospect."

"I was recently called in by the head of a concern who told me they had decided to install a truck."

"We want a three-ton gasoline machine," he declared. "That's the popular size, isn't it?"

"The popular size, I told him, 'is that best adapted to your needs. You're not dealing in popularity when you buy a motor truck, but in service. You may need a three-ton machine, or you may want a five-

ton truck. Again it may be a ton and a half that is best for your purpose. I don't know. Do you?"

"Well," he said, maybe we don't need one quite so big, but I thought I would be on the safe side."

"I suggested to him that we take the matter up with the head of the shipping department; that we determine the daily tonnage, the distance traveled in making deliveries, and the nature of the territory covered, after which we would be able to pass more intelligently on the subject."

"Go ahead," he replied, "I guess you know your business better than I do. Let me know the answer."

"The head of the shipping department proved to be a methodical chap, who was keen on statistics. We went over the situation at great length, and from the data thus secured I concluded that what the concern wanted was not a three-ton gasoline truck, but a one and a half ton electric. I informed the head of the company of my finding."

"What's the difference in price?" he inquired.

"I told him how much cheaper the electric was."

"Well, by George," he ejaculated, "at last I have discovered what appears to be an honest truck salesman."

"I could have loaded him up with a larger truck, and made a bigger sale, and he would have been none the wiser. But in the end it wouldn't have paid me, because the three-ton truck would never have proved satisfactory."

"Not long ago I was figuring on a motor delivery system for a retail establishment

that was doing its work with horses. One of the first things I discovered was that there was absolutely nothing to work on aside from the fact that they delivered goods. When I asked the chief shipping clerk how far one of their horses traveled in a day he said at least 50 miles, sometimes more. I knew that couldn't be, so I took the route book of the day before, picked out the longest run, and went over it in an automobile, watching the speedometer and checking up on the time required to make deliveries—that is, the duration of stops. I found that the run was just 23 miles—less than one-half what the shipping clerk had supposed, and that the driver and jumper were killing time by the way-side."

"The shipping clerk was astonished at the finding. So was the manager of the company. If I had taken their word for it, and gone ahead on that basis, they would have been the possessors of trucks not at all fitted to their requirements. The sale would not only have hurt me but it would have reacted on the company I represent."

"To give satisfaction to the buyer a truck salesman must often do things that are not to his immediate advantage. I have had visions of a five-ton sale, based on information volunteered, and when I came to run the facts down it dwindled to a two-ton truck."

"It takes a lot of time and work—but it pays. One dissatisfied truck owner will do more to harm your prospects than a dozen happy owners can offset. That is why too much care cannot be exercised in determining the installation that will work out the best."

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

WANTED—A COMPETENT MOTOR TRUCK DRIVER

By B. F. REIMOLD

There are numerous applicants to fill the position, but—are they competent?

What are the necessary qualifications to make a competent truck driver? How many applicants could intelligently answer this question and qualify?

Would the aspirants for the above mentioned position apply with fully as much confidence in their ability to the following:

WANTED—Competent motor truck driver to handle truck in a 7000-mile endurance run. Unless thoroughly experienced don't apply.

Answering the first question, three qualifications are necessary for the making of a competent driver—intelligence, energy and honesty.

A man of average intelligence will know how and where to drive a truck and will not take advantage of the horsepower under his control by driving through or over anything.

The instruction book gives all the information necessary to keep all moving parts of the truck properly lubricated, and he should know that after a day's work the truck should be gone over and attention given to oil, grease, gasoline and water.

The honest man will give a truthful version of accidents and break-downs. He will, by so doing, give information which often may be valuable to the truck maker; if breaks come about from defect or wrong construction there will be a remedy—if it is carelessness the driver may lose his job. But the intelligent man will be careful. All are apt to have accidents—make a clean breast of it and help better conditions.

The prospective truck buyer to-day says he will buy a truck if he can be assured of having a good driver.

The applicant awarded the job of driving a certain truck on a 7000-mile run would feel pretty good about it and he knows that it is his duty to handle the truck so that proper data can be arrived at as to motor and tires. For example, he knows that the motor cannot run without oil, water or gasoline, and he is never too tired to properly look after the supply. He knows when to shift gears and shifts when necessary. He doesn't drive through on "high" and let the motor labor when he knows that "second" is the proper gear to use.

He knows pretty much about getting through heavy roads and avoids mud holes. When they can't be avoided he takes proper precautions.

If he uses chains to get out of a soft place he will remove them after getting out and not pound along several miles over a hard road until he gets ready to take them off. If the use of chains is pro-

hibited he will not resort to the use of bricks, stones or bottle or anything that may come handy. He may use cinders, dry grass or jack up the trucks and place planks or boards underneath, and he gets out without leaving any marks on the tires.

And on the entire trip this man knows that "drinking" is absolutely barred.

Sobriety was not mentioned as one of the qualifications, as past experiences should by this time have impressed everybody that a man who cannot intelligently handle "booze" certainly can't drive a truck safely and sanely.

Railroad engineers that have right of way on steel rails are absolutely prohibited the use of intoxicants. In case of accident if there is any proof of drink being responsible in any way the guilty one is charged with a criminal offense.

The motor truck has a certain right of way, but at all times is guided by the man at the wheel, and only his alertness at all times will keep his record clear.

Now, if the applicant for the position of a regular driver will consider that in a way he is making an endurance run (say for one year, which as a rule is 7000 miles) he will get far better results if he is intelligent, energetic and honest.

He will know that to drive the truck without paying proper attention to gear shifting will eventually cause wear or



Group of Trucks in Various Lines of Business as Used in Hilly Kansas City

The center of the picture is part of the municipal police patrol fleet of Packard trucks. During the quarter ending July, 1914, three of these cars hauled 3393 prisoners, made 1935 trips, and covered 4100 miles. In the upper left is shown a Wilcox truck in coal delivery. In the right, one of a fleet of fifteen Pierce-Arrows, of the Kansas City Breweries Company. In the lower left, the three and a half ton GMC tank truck, of the Cudahy Refining Company. From the picture in the lower right it will be seen that truck bodies are sometimes used for other purposes than carrying manufactured goods.

The CCJ is the only truck journal a member of the Audit Bureau of Circulations—Why?

breakage in the motor bearings or transmission. He will not neglect taking care of the truck or abuse it simply for the reason that it is guaranteed for 1 year. His showing at the end of the 7000 miles should appeal to him just as strongly as any cross-country run ever made. He does not see his name in print, but the 7000 miles, on any truck in ordinary business, has more verifications than a staged endurance run, and the man who makes a creditable showing for the year is entitled to proper recognition.

A competent driver can easily show an earning of several hundred dollars per year above the incompetent man.

If the driver will consider the cost to the owner of running a truck, or if he be held personally responsible for thoughtless damage, the cost of upkeep would be far less.

The prospective truck buyer to-day often hinges the purchase of a truck on the promise of being furnished with an "experienced" driver—he had better ask for a "competent" man—there's a difference.

He has had information from a firm operating trucks telling him that the trucks are all right, but the drivers abuse them and the upkeep is enormous and advise him to delay buying until conditions better themselves.

The buyer looks to the manufacturer for relief and is it within the power of the manufacturer to bring about a remedy?

The driver is not always the direct cause of high upkeep any more so than the owner would always be the innocent victim. For example, a truck hauling building material: The buyer of a load of material demands it to be delivered in the yard and the driver is instructed accordingly. To enter the yard he must drive over the curb and he does so without any attempt to bank the curb—so long as the horsepower is there he keeps going and neither the owner nor driver give thought to any unusual strain the truck is put to.

A truck in freight hauling is held back to the last minute before closing time. It is overloaded and in order to get there on time owner, shipping clerk and driver know it must be driven at excessive speed.

Some streets at certain times of the year are impassable and it is no disgrace to any make of truck not to attempt going through. A railroad is not condemned when its trains are delayed by snowstorms—and railroads are far past the experimental stage. They run on steel rails and have sufficient horsepower on their engines, but they are not capable of mastering the elements. Neither will a railroad take a chance of wrecking a train to deliver a carload of goods.

If the truck owner will consider the cost of making some one of these unreasonable trips he will give far better delivery service, as his truck will be running a greater part of the time and not laid up for repairs as is usually the result where good judgment is lacking.

This class of owner does not hesitate to condemn the truck and expect the manufacturer to make gratis repairs and unless the dealer or manufacturer comply with his demands he threatens to buy another make of truck, etc. In the meantime, the driver is implicated in the transaction and if he ever had the making of a competent driver he is not furthered in that direction in a matter of this kind.

There are plenty of competent young men to be had and the solution is to make it an object for him and eliminate the undesirable.

Would the owner of a \$25,000 power plant put a man on duty who formerly run a peanut roaster? Hardly, but he has a fleet of trucks representing an investment of \$50,000 and not one of the drivers has a license or certificate showing their efficiency.

Possibly the manufacturer can bring about a plan to compel a rigid examination for truck drivers, making it both a mechanical and practical cause. Through this the competent man will get consideration, the owner better service at a less cost and the manufacturer more sales.

THE AUTOMOBILE HAS REVOLUTIONIZED DEPARTMENT-STORE TRADE

By FRANK REED

By making a great amount of outside territory accessible without raising the average cost of deliveries, automobiles have made the city department and dry goods stores a great factor in the suburban and nearby town development. They have enabled people in these localities to get the same buying advantage and style advantages as the city resident, and in doing so, have greatly extended their trade. This is the opinion of Barney Slavin, manager delivery department of Bullocks, a great dry goods store in Los Angeles.

He cites the example of the women residing in Long Beach, who under former conditions would certainly have hesitated to come to Los Angeles to do their shopping for many articles which they would either have to take back with them or employ the unsatisfactory delivery service which existed before the automobile came into general use. Now they can make their purchases in Los Angeles one day and have the goods delivered before 3 p.m. the next day.

Owing to this revolution, automobile delivery has actually become a recognized necessity in the department store, and the

importance of the delivery of the general plan of operation, has received increased recognition. Both electric and gas cars are necessary in a department store fleet. In Mr. Slavin's experience, the electric and the gas car do not compete.

This store is at present using horses for quite a lot of its work, but the manager considers that the superiority of the automobile has been demonstrated and that it is the thing to use. The electric at present in use—two cars, both 1000-lb. vehicles—have been in use 1 year and 11 months respectively. They were put on to take care of growth in the business.

Both electric get a boost at noon. Since these cars have been owned, the company has been put to no expense for tires and very little for repairs. One of the cars has shown repair charges of less than \$4 a month in the present year, January 1st, and the other car less than \$5 for the period from January 1st to August. This speaks well for the careful driving and general good treatment in service of which this department accords to its trucks. And this is further borne out by evidence of the good condition of its gas cars.

One feature of their delivery problem, as a whole, is the fact that packages are assembled according to route in the sub-basement. At present they load on a truck in the sub-basement, which is taken up on the elevators to the sidewalk, where the packages are transferred from the truck into the auto. This is considered to be more practical than the use of two bodies, as the bodies are expensive and finely finished, and it is not desired to either duplicate the expense or run the risk of marring with repeated handling.

In making a comparison of delivery conditions in the motor-truck zone to get a general view of their relation to those prevailing with horse deliveries, Mr. Slavin finds that with horse delivery the store had no suburban delivery, and very insufficient special delivery. Now, by using a properly balanced gas and electric fleet, for about the same money, gives a service which in extent and quality is at least 100 per cent. better than what was possible with horses.



An Unusually Attractive Hearse

The compartments at front and rear permit the handling of two caskets at one time, should necessity arise. In usual cases, the rear compartment is used for flowers. It is mounted on a Pierce-Arrow chassis with Polack tires.

The CCJ has most advertisers because it gives them biggest returns



LET the Firestone Service Shop of your city stand back of your delivery system. It means minimized expense and multiplied reliability.

In the large trucking centers owners will find a Firestone Service Station complete enough to rebuild truck wheels when necessary or to standardize equipment.

If your trucks are not yet equipped with Firestone Quick Removable Rims of S. A. E. Standard, turn truck by truck in now to be standardized.

Then your own drivers can at any time, anywhere, change a tire, even on heaviest trucks, in a few minutes with perfect ease and sureness.

Firestone Tires, suited to your needs, on Firestone Rims, backed by Firestone Service Station help in emergency, insure lowest cost and highest efficiency.

Write for Truck Equipment Catalogue—then call a Firestone man for consultation.

Firestone Tire & Rubber Co., Akron, Ohio— BRANCHES AND DEALERS EVERYWHERE

"America's Largest Exclusive Tire and Rim Makers"

Pneumatic Tires, Truck Tires, Pleasure Electric Tires, Carriage Tires, Cycle Tires, Fire Apparatus Tires, Rims, Tire Accessories, etc.

Firestone

TRUCK TIRES

When Writing, Please Say—"Saw Your Ad. in the C C J"

WHEN THE AGENT CAN'T AFFORD TO SELL A TRUCK

By LEN G. SHAW



K EIDAN was greeted cordially when ushered into the general manager's presence by a much bebuttoned youth in a blue uniform.

"Sit down, and make yourself comfortable," said the G. M., indicating a chair, and producing a box of choice cigars.

"I thought I'd drop in and see if you are ready to put in another truck," said Keidan, when greetings had been exchanged. "You've had one of ours working more than a year now, and your business is growing all the time."

"That is true," said the G. M. "We wouldn't want to get along without a truck, either," then noting the pleased expression on Keidan's face, he hastened to forestall further inflation by adding, "and we don't want another one, either."

"How does that come?" inquired the nonplussed Keidan. "One second you say that you wouldn't want to get along without a truck, and in the next breath you say that you don't want another."

"Well, we've discovered that a truck costs too much—that we can do the work cheaper with teams. It cost us between two hundred and three hundred dollars for repairs to the truck last year—and you know that's something frightful."

"Much of that must have been the fault of the truck," volunteered Keidan.

The general manager swallowed hook, line and sinker, without seeming to realize that he had been caught.

"It certainly was," he agreed, "just about all of it."

"May I see those repair bills?" asked Keidan.

"You can," was the prompt response. "I've been holding them in my desk waiting for you to come in. Now, here," said the G. M., impressively, as he picked up the first of the sheets and waved it in front of Keidan, "is a bill for \$188 as an opener—\$188, mind you. What do you think of that?"

Keidan took the bill and looked at it for a moment. It called for new cylinders and installation, as well as several other items.

"That was the day your truck was driven over to Comerford with a load, wasn't it?" asked Keidan, receiving an affirmative reply.

"The roads were bad, and the driver telephoned to the bookkeeper that he didn't think it would be safe to come back that night?"

"Yes."

"The bookkeeper told him to leave the truck there until the next day?"

"Yes."

"He left it standing out of doors all night, and it was one of the coldest nights of the winter. The engine froze up and the cylinders cracked. Isn't that right?"

"Well, yes, practically so," admitted the general manager, beginning to appreciate his position.

"Why didn't the driver draw the water off the radiator?"

"I don't suppose he thought that far. Besides, we had an anti-freeze solution in it. It shouldn't have frozen if the radiator was all right."

"Who guaranteed the anti-freeze solution?"

"Why—I don't know as anybody did—we just bought it, and put it in the machine."

"And on the strength of that you are blaming the truck and the maker. I don't suppose you would believe me if I told you we didn't make a dollar on that job, after we had towed the truck in and repaired it. Was the truck to blame for the conduct of your driver? I'm asking you as man to man. Was it?"

"No, I guess you got me that time all right," said the G. M., trying to laugh the incident away. "But how about these other charges?"

"I find," said Keidan, thumbing the sheets critically, "that you are charged with an unusual number of dope cups and pet cocks. Now, that isn't the fault of the maker. Dope cups and pet cocks are put on just as securely as we know how, but the constant vibration will jar them loose, and if they are not tightened repeatedly, off they drop. It's one of a good driver's duties to go over his car frequently, and see that they are all in proper condition, now wouldn't you think that it is?"

"Well—yes—I suppose it is."

"Now," said Keidan, making some hasty calculations, "taking the charges you admit were the fault of the driver, we have something over \$200 out of a total for the year of less than \$300. Do you call that bad, when the service you have received from the truck is taken into consideration?"

"But it costs us more than the same work would with horses," protested the general manager, evasively.

"What are you paying to run the truck—how much a day?"

The G. M. quoted a figure.

"You can't do it for that," asserted Keidan. "With a driver at \$3 a day, and a jumper at the same price, there isn't enough left of your allowance to reach around. How much do you pay for gasoline?"

The G. M. hesitated.

"I really don't know," he admitted.

"How much did you use last year?"

"We didn't keep any account. I suppose the bills would show."

"How many miles did the truck travel?"

"I don't know. We never paid any attention to anything like that—just loaded the truck up and sent it off. But I know that it cost us more than our horses did—because our barn man said so, and look at the repair bills."

"Most of which might have been avoided with a competent, careful driver," suggested Keidan. "Supposing you ran your whole business with the same thoroughness that you have your truck—how long do you suppose you would last?"

The general manager bristled. "There isn't any use of carrying this discussion any further. I'll admit that we were largely to blame—but we don't want another truck, now nor ever."

"And I don't mind telling you, with the very best of feeling, that we don't want to sell you another truck under existing conditions," said Keidan, preparing to take his departure. "We simply couldn't afford to do it, that's all."

The Brase Motor Truck Company, of Minneapolis, Minn., recently sold fifty Brase Packets to S. A. Chemey, purchasing agent of a large motor vehicle company of Henley Beach, Adelaide, Australia. These will be shipped without bodies, and will be equipped with panel bodies for commercial use upon their arrival in Australia.



Daniels & Fisher Stores at Denver, Col., Have Found This Body Highly Successful for Their Work

It is a body designed especially to reduce the prominence of the heavy truck "lines"; a body that possesses more class than is generally expected from truck bodies, and at the same time is efficient from a working standpoint.

■ Friction, not revolutions, destroys the machinery,---lubricate ■

The CCJ has most readers because it gives most information



Truck service is measured primarily by the quality built into the product.....and by pre-purchase counsel that enables the buyer to get a truck fitted to his requirements. Such service is good for the buyer and for The White Company, because the interests of buyer and seller are mutual both before and after the sale.

Service in a White is haulageton-miles. This puts profit in the buyer's till. Service that means *only* quick repairs is like a crutch or a splint. Service that is *built in* means maximum hauling and minimum dry-docking.

White Trucks are the trucks most generally selected by those houses whose trucking problems call for fleets. Fleets grow gradually. They indicate to the thoughtful business man.....that the first truck or the first few trucks gave eminent satisfactionand the fleet grew.

Drivers in a White fleet can go readily and without experiment from one truck to the other. The care and adjustment are uniform. To know one White is to know all. White trucks are made in every capacity three-quarter ton up to five tons.


THE WHITE COMPANY
 CLEVELAND

New York - Broadway at Sixty-Second Street
 Chicago - 2635-2645 Wabash Avenue
 Boston - 930 Commonwealth Avenue
 San Francisco - Market St. and Van Ness Avenue
 Baltimore - Mount Royal and Guilford Avenues

Philadelphia - 216-220 North Broad Street
 Pittsburgh - Craig Street and Baum Boulevard
 Atlanta - 63-65 Ivy Street
 St. Louis - 3422 Lindell Boulevard
 Washington - 1233 20th Street, N. W.

Seattle - 1514 Third Avenue
 Memphis - 278-280 Monroe Avenue
 Newark - 33-35 William Street
 Dallas - 2025-2027 Commerce Street
 Toronto - 14 Alexander Street



When Writing, Please Say—"Saw Your Ad. in the C C J"

Too Much Service, and a Remedy

By FRANK REED

LIGHT cars are being bought now for the same kind of work to which heavy cars were misapplied a year or two ago. The men who could not keep the heavy cars going under full load are learning the economy of light cars. At the same time, they have not all learned that a light car has its limitations, both as to load and speed.

Sixty miles an hour over ordinary roads is rather fast for the best pleasure cars. In fact, no ordinary driver would be able to push a pleasure car all day, and day after day, at such a speed. Yet some manufacturers will put out catalogues and permit their salesmen to make the statement, to a prospect, with every appearance of honesty and conviction, that he can run a commercial car, fully loaded, on solid tires at 20 m.p.h. The buyer is likely to broaden this to cover an overload, and occasional higher speed. As the gear ratio on a commercial car is three times as great as on a pleasure car, 20 m.p.h. for a truck means running the engine at a speed which gives 60 m.p.h. in a pleasure car. In fact, in one make of car on the market the motor is frequently made to drive the car at 20 miles, and this speed corresponds to a speed of 65 miles in a pleasure car of well-known make, in which the same motor is used. The fact that cars subjected to this kind of abuse last several years is a fine testimonial to their good construction, but none the less it is bad policy for the owner and dealer to tolerate such speed.

The best cure for overdriving is to pick drivers carefully, paying the wages necessary to get good men and putting one man in charge of all truck operations. Some truck owners are cheerfully paying \$140 a month or more to a stationary engineer who sits still beside a steam engine all day, but fail to see the necessity of paying even \$20 a week to a man who runs a motor truck on the street, where he has a machine of many parts, going all the time, and subject to a thousand emergencies for every one met by the steam engineer.

The effect of overspeeding on repair expense is illustrated by a comparison which this dealer, who is an old hand at the motor-

truck business and thoroughly understands it, has taken from his books. An owner of a one-ton car, although he had several drivers, some incompetent, kept the speed down to 10 m.p.h. They often loaded the truck to double capacity, but still, due to the moderate speed, this car was run for 16 months with repair bills averaging only \$3 a month. Another owner of four cars had repairs of \$375 to \$500 a month and he ran three cars completely out of service, so that the dealer bought them back inside of a year for \$450 for the three. In this case, the cars were run by newsboys. They would quit shooting craps in the alley, throw a load indiscriminately on a truck, and slam it down to the station, dodging, skidding and bumping along at high speed, with no knowledge of the mechanism of the truck, and no care for the property—and the owner footed the bills.

Dealer Merely a Custodian for Part of Purchase Price, Which He Retains

Many dealers who try to give too much free service, backing up promises which should never have been made, are losing money, and the more trucks they sell the more they lose. There is always somebody coming along with a new truck and securing an agent, who goes out and before long puts over sales to some business friends. If he gets \$450 commission on a truck it looks like a fine day's work, and he never stops to figure that his relationship to this money is merely that of a custodian or trustee for all but about \$65 of it, and that the balance will be expended gradually in service, which he has promised and is bound by his promise and competitive conditions to give to the customer. About the second year the guarantee runs out and the third year the truck has depreciated 60 per cent., and then he runs into the real problem, which is keeping his customers satisfied and continuing to make money. Things will get better for both dealers and owners when owners more generally adopt the policy of standardizing on one make of truck and sticking to it. If they mix up four or five makes of trucks in a fleet they are unable to shift drivers from one truck to another and obtain the best service. Selling

expense is higher and uncertain, and manufacturers and dealers are going to play safe in figuring it into the price. No dealer is going to exert himself to help either driver or owner, and conditions as to both operating and repairs are not nearly as economical as can be secured with a fleet of one good make.

Every Owner of Six Cars Should Have a Little Shop


In regard to service, owners as well as dealers must realize that there is a certain sum of money for service figured into the price of each truck. The owner who lets his truck run down, being frequently in the repair shop due to overloading and overdriving, and lack of attention to washing, oiling, etc., may think that it is not costing him anything, because he gets free service, but as a matter of fact this sort of thing reduces the life of the truck, and if the owner figured his depreciation he would find that he was losing more than the man who keeps his trucks up in good shape by employing competent men and having an inspection every night, and seeing to repairs while defects are slight. Any man who owns six cars ought to have a little shop of his own. One man alone can attend to most of the repairs on six cars, if he has about \$150 worth of equipment. He needs a little lathe, a hand-drill press, a good bench, a big vise and a little vise, and two sets of block and tackle so that he can raise bodies by himself. With the type of block and tackle made by a Detroit manufacturer which this dealer has tried out for 3 years, one man can raise or lower a body to any degree desired, and lock it in place by pulling a string. It is a safe device. Just the ordinary care and washing, etc., at the lowest price a man could possibly get, having the work done outside, would come to 75 cents per car, \$4.50 per day, so the economy of the little repair shop is evident. If a man has fifteen trucks he should be able to give them the necessary care from a shop equipped with about \$500 worth of machinery, and manned by one competent mechanic, a boy, and a negro helper to do the washing, oiling and rough work.



Jeffery Quad Used As Snow Plow

Fitted with a snow scoop, this machine was used to clean up the snow around the factory

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers



The Truck Question

—are you facing one?

Does your particular problem of transportation present a difficult angle? If it does, then you should know what aid you can draw from General Motors Truck Co., the world's only manufacturers of a full line of both gasoline and electric trucks.

GMC Trucks are being operated in most all lines of business in all parts of the country. Our experience thus gained is at your disposal in solving **your** truck question.

GENERAL MOTORS TRUCK CO

One of the Units of General Motors Company

PONTIAC, MICHIGAN

Branches: New York, Detroit, Boston, Chicago, Philadelphia, St. Louis, Kansas City, San Francisco

Electric

Chassis Prices
(Without Battery)

Capacity	Price
1000 lbs.	\$1200
2000 lbs.	1300
3000 lbs.	1450
4000 lbs.	1650
6000 lbs.	1900
8000 lbs.	2100
10000 lbs.	2350
12000 lbs.	2500



Gasoline

Chassis Prices

Capacity	Price
1500 lbs.	\$1090
1¼ Tons	1500
2 Tons	1900
3½ Tons	2500
3½ Tons	2500
5 Tons	3000
5 Tons	3000

When Writing, Please Say—"Saw Your Ad. in the C C J"



Within the past few weeks particular emphasis has been laid upon the remarkable capacity of the spring department of the Sheldon Axle and Spring Company to a marked degree. In this period of time several rush orders of more or less special construction have been handled with such speed as to cause favorable comment on the part of the manufacturers requiring this unusual and exceptional service.

So that at this time we wish to bring out emphatically this particularly patent fact that is facing the manufacturers both of pleasure cars and trucks. Not only can they depend upon the Sheldon organization to deliver the most scientifically designed and most scientifically manufactured products possible to obtain—but with a series of spring plants covering a total of more than 14 acres of ground—with a daily production



capacity of more than 3,000 springs varying in weight from 12 pounds to 300 pounds each and with the utilization of from 50 to 75 tons of steel daily as the raw stock necessary to turn out this vast amount of finished product—they may be assured of the greatest possible speed in shipping the finished product, with absolutely faithful adherence to scheduled shipping instructions.

Again let us call your attention to the fact that we are now equipped to furnish Sheldon Worm Gear Axles for the 1500 pound capacity size as well as in the larger sizes. As we have stated before this smaller unit differs from the other models practically in size and capacity only. It is of the semi-floating type with both radial and thrust loads on the worm and gear taken by ball bearings—and designed solely with the view of giving maximum service at minimum cost without any purpose of forcing the sale of bearings.

In addition to worm gear axles and springs the Sheldon Axle and Spring Company also specializes in the manufacture of front axles, brake and radius rod equipments.

THE SHELDON AXLE AND SPRING COMPANY

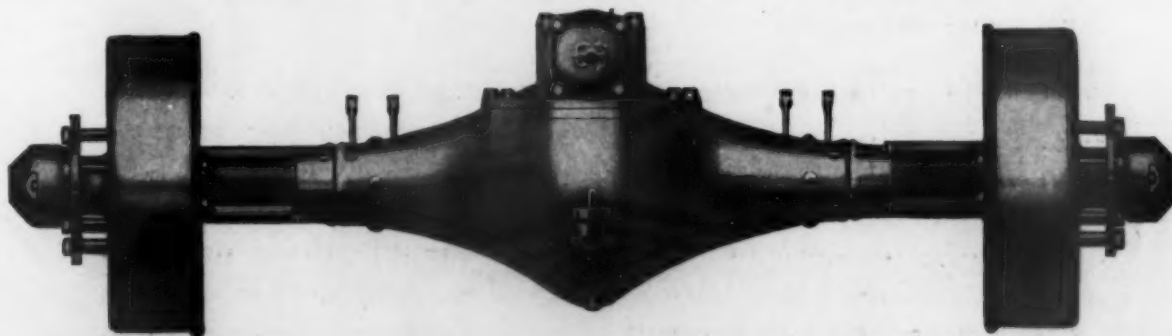
MAKERS OF SPRINGS AND AXLES FOR HEAVY DUTY SERVICE FOR MORE THAN 50 YEARS

WILKES-BARRE, PENNSYLVANIA

Chicago: 122 S. Michigan Blvd.

San Francisco: 444 Market St.

Detroit: 1215 Woodward Ave.





The SIGNAL Line



Chassis Prices f.o.b. Detroit

One-Ton Chain Drive	-	-	-	-	-	-	-	\$1400
One-Ton Worm Drive	-	-	-	-	-	-	-	\$1500
One and One-Half Ton Worm Drive	-	-	-	-	-	-	-	\$1700

All models furnished in two lengths of wheelbase

This Truck is a Business Builder

This is a mighty important factor to the dealer who is building for permanence. It is more important than immediate profits. A truck may sell because of low price or some fancied advantage only to fall down in the tests of hard usage. The immediate profits are lost in giving free service and repairs while the task of living down the hard feelings and bad reputation is even more costly.

There is no such danger with the SIGNAL. It is a different kind of truck. It is not only built to sell, but is also built to serve. That is important, for a truck that serves faithfully and well is one that creates business for you. Every one on the road is a moving advertisement of SIGNAL quality and efficiency. This is mighty valuable, and the records these trucks make serve to bring new business to your doors. Therefore, a SIGNAL agency means a signal success.

Why is the SIGNAL so successful? First of all—because it is built right. The standard parts used

are typical of the construction throughout. Such names as Timken Axles and Bearings, Continental Motor, Covert Transmission, Detroit Springs, Timken-David Brown Worm-Drive Rear Axle, Russel Jack Shaft, Gemmer Steering Gear, Eise-mann Magneto, Stromberg Carburetor tell an indisputable story of quality.

Then the capacities—one ton and one and one-half ton—are the easiest to sell. They have the widest application to delivery conditions. The choice of worm or chain drive and two lengths of wheelbase in the one ton, with the worm drive ton and a half, meet practically all requirements.

The SIGNAL sells because its quality and value are readily apparent and its adaptability is the greatest. It builds business because it gives such service that repeat orders and new business are inevitable. The agency for such a truck is profitable now and *in the future*. Surely you are sufficiently interested to write us now asking for proof.

Signal Motor Truck Company, Detroit, Michigan

When Writing, Please Say—"Saw Your Ad. in the C C J"

STEEL WHEELS

for

MOTOR TRUCKS

Cast-Steel
Disc
Type
Motor
Truck
Wheel

Uniformly
Heat Treated



Designed
for
Standard
S. A. E.
Demountable
Tires

Lighter Than
Wood Wheels

Photograph Showing 150 Wheels Ready for Shipment
PART of One Order for 2000 Wheels

That the general adoption of the cast steel, disc type of wheel for motor trucks is here, there is no doubt. There are many sound reasons in favor of the economy and reliability of "BESCO" Steel Wheels for trucks. "BESCO" Steel Wheels possess individual features not found on other metal wheels. They were selected by the U. S. Government and Foreign Nations as the best wheel equipment for trucks in Government service.

"BESCO" disc type Steel Wheels are particularly adapted to heavy trucks, permitting great saving in weight over wood wheels. Front wheel design is such that center of tread and steering knuckle is brought practically in line, making

steering less difficult over rough and crowded streets.

"BESCO" Wheels are especially adaptable for the mounting of worm drive axles, due to the heavy unsprung loads of this type of axle. Torque exerted at the hub on this type of drive is uniformly distributed throughout the disc, from the hub to the rim, whereas, in the wood wheel construction, these strains must be transmitted through a built-up construction, consisting of hubs, flanges, spoke-bolts, spokes and rims.

We have published a most complete catalog, fully illustrated, on "BESCO" Wheels—send for your copy today and get posted thoroughly on this coming type of motor truck wheel.

Buchanan Electric Steel Company, Buchanan, Michigan

Originators and Designers of
Cast-Steel Disc Wheels for Motor Vehicles

**Electric Furnace
Castings**

Originators and Designers of
Double-Disc Pressed-Steel Wheels



Baker Electric Trucks

are in service in 98 distinct lines of trade in as many different cities located in the United States, Canada, Alaska, England, France, Porto Rico, South America, South Africa, Siam, Japan and Australia. Our Truck catalog shows many of these trucks and gives interesting figures on what they have actually done. May we send it to you?

Capacities: one to five tons.

Body designs to meet any requirement.

The Baker Motor Vehicle Co., Cleveland



Your trucks will be more efficient, their operation more economical, and their life greater if they have

Celfor Axles

**INTERNAL GEAR DRIVE
ABSOLUTELY QUIET**



This new axle is offered motor truck designers and manufacturers as being the best drive for motor trucks on the market.

It fully meets the requirements of the foremost engineers who are insistent that a live axle shall not carry both the load and transmit the power, but that these two functions shall be separately cared for without excessive weight or diminution of strength.

The dead rear axle is an I-beam section, enlarged at center, gradually tapering to spring pads. This eliminates deflection of solid axle and holds live axle in true alignment. The live axle is a separate unit supported by the dead axle at center of I-beam construction and on brake support castings and is of rigid construction in itself.

The combination of the two increases the strength of both members, eliminates much power waste, prolongs the life of working members and promotes greater efficiency.

The Celfor Axle is designed for trucks of from $\frac{3}{4}$ to 3 ton capacities and is the result of careful study of drive requirements and extensive experiments by our engineers. It has proved itself to be the most efficient and economical method of power transmission for motor trucks within the above range of capacity.

Send for complete illustrated catalog

Celfor Tool Company

BUCHANAN, MICHIGAN U.S.A.

Know exactly what
your Truck is
costing you



JONES HUB ODOMETER

Accurate comparison of your trucking costs over different periods gives you definite knowledge of how your truck is standing up in use, and helps you to determine whether it is making or losing money for you. This is only one of the many uses that makes the Jones Hub Odometer indispensable.

It keeps tabs of your tire mileage. It makes it easy for you to prove your exact fuel consumption. It indicates any unauthorized use of your truck. In short, it tells you the truth about what your truck is doing.

This is both the simplest and most accurate mileage recorder made. It records backward as well as forward wheel travel and is impossible to tamper with because it is sealed permanently when attached.

Fits all standard makes of motor trucks, replacing the regular hub cap. In ordering specify name of truck, year built, model number or letter. Also wheel diameter and, if possible, actual wheel travel through one revolution. Price, \$20.

Write for booklet

A Plug that
won't short-
circuit



A specially constructed plug with two deep chambers around the center electrode which make it literally self-scouring and most effectively guard against short-circuits due to carbon deposits.

J-M Soot-Proof SPARK PLUG

Made in two units which permit the porcelain to be easily removed and replaced without disturbing the shell in the cylinder, and which remain *gas-tight* under highest compression.

This plug is built to stand up and deliver. For fourteen years it has held the preference of the hard-to-suit owner. A real economy because it seldom needs replacement. Price, 75c at your dealers. Ask for it by name.

Write for booklet



One Firm One Service
One Guarantee back of
every J-M Accessory



H.W. JOHNS - MANVILLE CO.

Albany
Atlanta
Baltimore
Birmingham

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Dallas
Dayton
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St. Louis

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San Francisco
Seattle
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Tampa
Washington
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Youngstown

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED

Toronto Montreal Winnipeg Vancouver

When Writing, Please Say—"Saw Your Ad. in the C C J"

The Greatest Show of All



More impressive than all the exhibits in Shows and salesrooms is that given by

SCHWARZ WHEELS

in carrying their burdens—often excessive in weight—in the everyday work of commerce. The Show exhibits have their place. They enable you to get the theory, see its application, note the construction, observe the quality and workmanship, learn why the best makers use them.

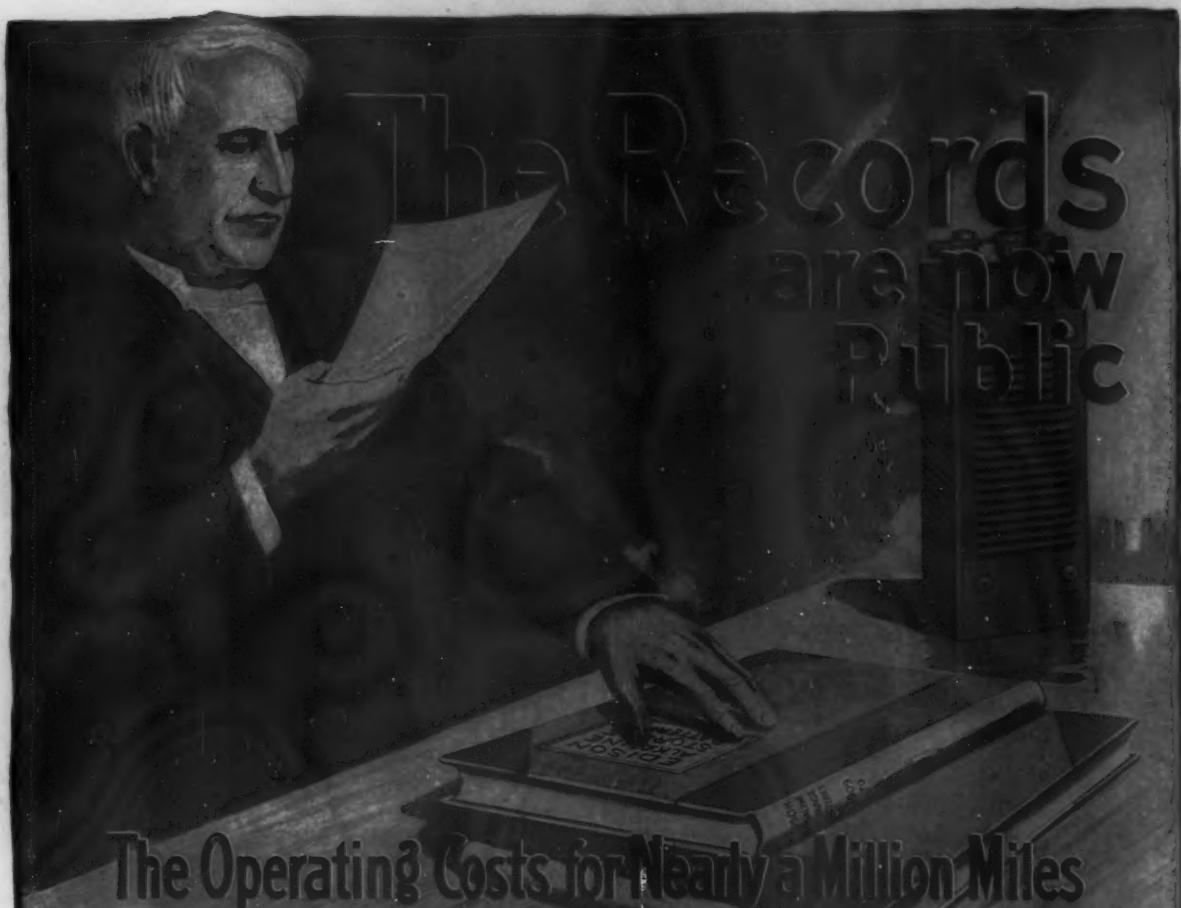
They inform you as to why the Schwarz method of construction is superior and what you can expect from such wheels. But, after all, the point of chief interest to you is—What do they do in service?

That is why the hundreds of SCHWARZ WHEEL-equipped trucks in any large city are the most impressive exhibit of all—it shows how thoroughly, staunchly and capably SCHWARZ WHEELS bear the burden and how superior they are to ordinary wheels.

We want you to believe in SCHWARZ WHEELS as most of the leading makers believe in them. To do this you should get our booklet, "Bear the Burden," see our exhibit, interview makers who use them, and then get first-hand testimony from users and from observation as to what they actually do in service.

Do this, and as sure as day follows night you will conclude that your trucks should have SCHWARZ WHEELS, if you want the utmost in strength, safety and service.

The Schwarz Wheel Company
Frankford Philadelphia Pennsylvania



I CLAIMED that the New Alkaline Storage Battery would make the Electric Vehicle the cheapest means of Street Transportation, but I had only my private tests to satisfy me. Today thousands of Edison Batteries in thousands of Trucks and Delivery Wagons are making Operating Records that are easily investigated by all. After the four or five years of hard service that many of these vehicles have had, is it possible to deny that my claim is proved?

Thomas A. Edison

HERE IS ONE RECORD—A REPORT—ON
22 FIVE-YEAR-OLD EDISON BATTERIES



The Edison Storage Battery Plant at Orange, N. J., one of the largest of its kind in the world.

Write for Bulletin on the use of Edison Batteries for Lighting Country Houses, Lightmen and Lighting of Gasoline Cars, Yacht Lighting, Railway Train Lighting and Signaling, Telephone, Telegraph and Wireless and High-speed or Low-speed Passenger Electric.

Edison Storage Battery Company

Orange, New Jersey

Edison-Batteries at: New York Chicago Boston Cleveland Washington San Francisco Los Angeles Portland, Oregon Seattle

ADAMS EXPRESS COMPANY

242 WEST 47TH STREET

New York, December 7th 1914

Edison Storage Battery Company,
Orange, N. J.

Attention of
Mr. A. Bachman,
V.P. & Gen'l Mgr.

Gentlemen:-

Thank you for consenting to extend from five to six years the conditions of your guarantee regarding renewal of positive plates.

The average operating cost per battery per month of the twenty-two trucks at Indianapolis, equipped with Edison Batteries in November 1909 and averaging about 640 miles per month, is as follows:-

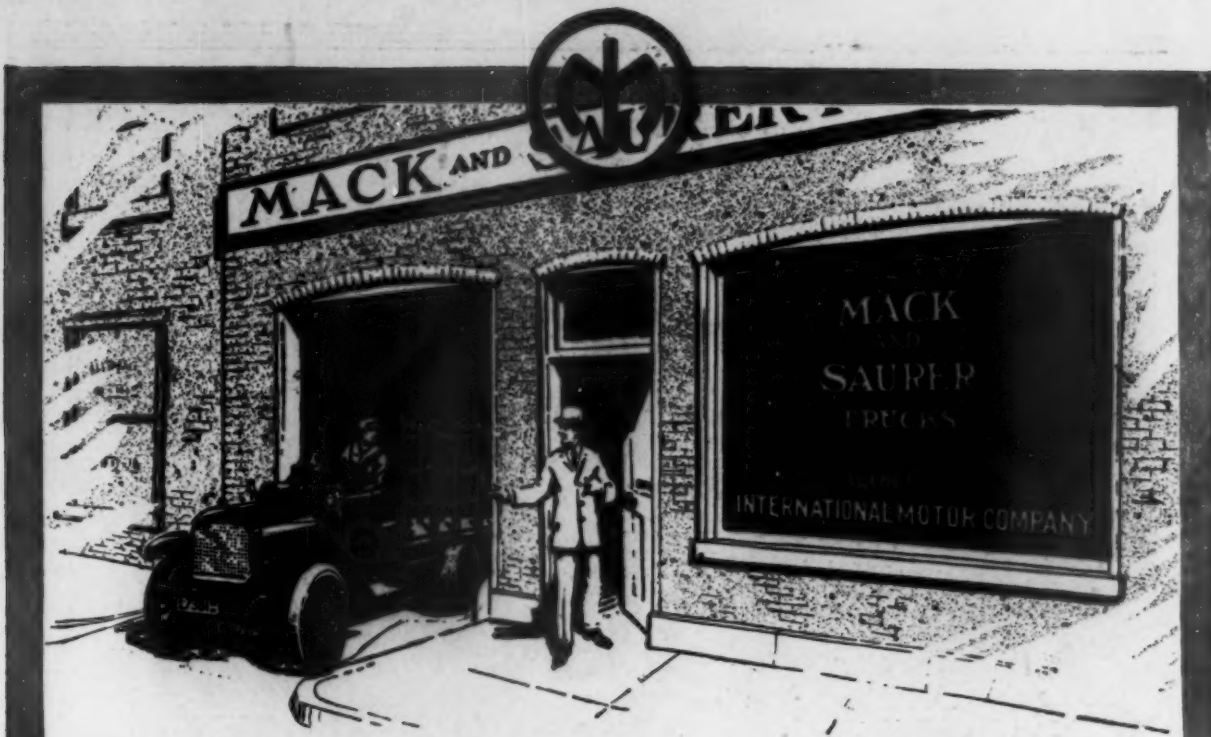
YEAR	BATTERY MAINTENANCE		CURRENT	TOTAL
	Material	Labor		
1910	\$3.47	\$4.10	\$10.08	\$17.65
1911	3.41	4.10	9.93	17.44
1912	3.41	4.10	9.90	17.41
1913	3.40	4.10	9.17	16.67
1914 (to Oct. 31)	3.11	4.10	9.80	16.17

The average total operating cost per battery per month has, therefore, been \$16.60 for a period of five years. At this time the average mileage per truck was about 40,000, which reduces the operating cost to \$1.00 per mile. The batteries are still in service.

Yours very truly

Superintendent

CS-1217



MR. MORRIS' OWN STORY

J. A. MORRIS sold \$100,000 worth of MACK and SAURER Trucks in and around New Haven, Conn., last year. This year, with the new MACK model behind him, he expects to double these figures.

He had little capital, but a mighty good selling plan; the backing of the International Motor Co's selling help, and the right line.

The MACK is the oldest complete line of trucks in the country. It has been successful for 16 years. This year's truck with many improvements comes just when conditions are best for starting an agency. Mr. Morris' story will interest you. So will the new MACK and our dealer proposition. Drop us a line today.

INTERNATIONAL MOTOR COMPANY
WEST END AVENUE AND 64TH STREET, NEW YORK



Pierce-Arrow Motor Truck Wins Against Time Forfeit of \$300 a day

When Pierce-Arrow Truck No. 184 delivered 290 tons of sand in 10 hours on a round trip haul of $1\frac{1}{2}$ miles it settled once and for all the assertion that contractors cannot profitably use motor trucks on short hauls. Employed by the McKelvy-Hine Construction Company, of Youngstown, Ohio, on a railroad job, working against a time forfeit of \$250 to \$300 a day, this truck delivered an average of 225 tons daily for 125 working days.



The Worm-Gear

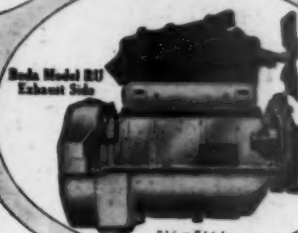
All Pierce-Arrow Trucks are equipped with the worm-gear drive, which is a positive guarantee of effective service under the most difficult conditions.

The cost of operating the truck was \$15.50 per day, making the average cost of delivery $6\frac{1}{2}$ cents per ton. McKelvy-Hine's Superintendent is authority for the statement that the truck did the work of 14 horses, 7 drivers and 7 two-yard wagons, which would have cost \$42.00 a day, or $18\frac{2}{3}$ cents per ton, delivered. The net saving on the job was, therefore, \$26.50 per day, to say nothing of the fact that the truck handled the material so quickly that no labor was ever idle.

THE PIERCE-ARROW MOTOR CAR CO.
BUFFALO NEW YORK

Don't guess—find out!

Suppose we assure you—as we *do*—that in accessibility and convenience, power and economy, design and durability, the Buda motor is unexcelled for your purpose at any price. That means your next order for us surely—*unless you have a doubt.*



Buda Model BU
Exhaust Side

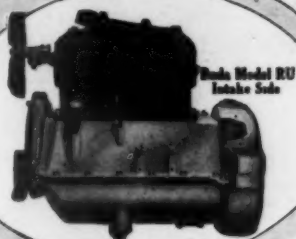
2 1/2 x 8 1/2 in.

BUDA MOTOR

"The part that sells the truck"

Now, in the above assurance, we *mean* what we say, exactly at face value. If you **THINK** some other motor is better than

a Buda or a better *buy* than a Buda, you owe it to yourself to make us prove up. *Don't guess—find out!*



Buda Model BU
Intake Side

THE BUDA COMPANY

(Factory, Harvey, Ill., Chicago Suburb)

Address all correspondence to our factory representatives:

BRANDENBURG & COMPANY

1108 S. Michigan Ave., Chicago 87th & Broadway, New York 1311 Dime Bank Bldg., Detroit



FAFNIR BALL BEARINGS

MADE IN AMERICA
SOLD DIRECT FROM FACTORY
DELIVERIES ASSURED

WHY BUY ABROAD?

ABSOLUTE INTERCHANGEABILITY
MORE SILENT THAN THE "MOST SILENT"
CLOSEST POSSIBLE LIMITS MAINTAINED AND
GUARANTEED

"AMERICA'S QUALITY BEARING"

SUBMIT YOUR ENGINEERING PROBLEMS. WE ARE IN POSITION TO WORK THEM OUT TO YOUR ENTIRE SATISFACTION. NEW CATALOG READY FOR MAILING

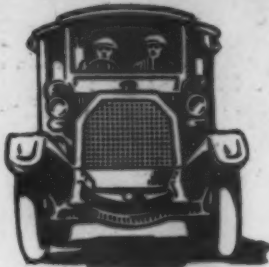
THE FAFNIR BEARING COMPANY, NEW BRITAIN, CONN.

When Writing, Please Say—"Saw Your Ad. in the C C J"

There's no leak proof ring but the **LEAK-PROOF** Ring — insist

DOLLARS

Are Leaking
From the
Cylinders of
Your Truck



While you are studying cost sheets—checking over supply and repair bills—worrying over inefficient service—the old one-piece piston rings in your engines are steadily leaking dollars, in the shape of power.

Their unsealed openings, poor, unequal bearing on the cylinder wall, make proper compression impossible—diminish power production. The same faults allow surplus oil to work up, causing excessive carbon deposit, followed by scored cylinders, friction loss, motor wear and heavy cleaning and renewal expenses.

Made in
All Sizes

LEAK-PROOF

Easily
Adjusted

Piston Rings

Made by McQuay-Norris Mfg. Co.

To protect you from imitations **LEAK-PROOF** is stamped on the ring—insist

quickly overcome these defects. They have no unsealed openings—bearing is always firm and equal, resulting in maximum power—minimum carbonization.

The use of **LEAK-PROOF** Piston Rings is an economy all round. You may find it makes all the difference between profit and loss in your truck operations.

Send for FREE Book

"To Have and To Hold Power." It tells all about piston rings and why you should equip your motor with **LEAK-PROOF**. How it will pay you in fuel economy and prolonged motor life.

"Ask the User"

In use on
over 300,000
motors



Sold by all up-to-date dealers, garages and repair shops

PATENTED
PISTON RINGS

MANUFACTURED BY

McQuay-Norris Mfg. Company
Dept. C, St. Louis, U. S. A.

CANADIAN FACTORY: W. H. Bonfield & Sons, No. 120 Adelaide Street, West, Toronto.
BRANCH OFFICES:

NEW YORK, 1919-29 Broadway at 64th St.
PITTSBURGH, 7629 Tiers St.
KANSAS CITY, 513 New Nelson Bldg.
DALLAS, 1509 Commerce St.

CHICAGO, Suite 718 Michigan Bldg.
Michigan Ave. and Washington St.
SAN FRANCISCO, 164 Howard Bldg.
LOS ANGELES, 224 Central Bldg.

Look for the name **LEAK-PROOF** stamped on the Ring

When Writing, Please Say—"Saw Your Ad. in the C C J"

Wisconsin

CONSISTENT

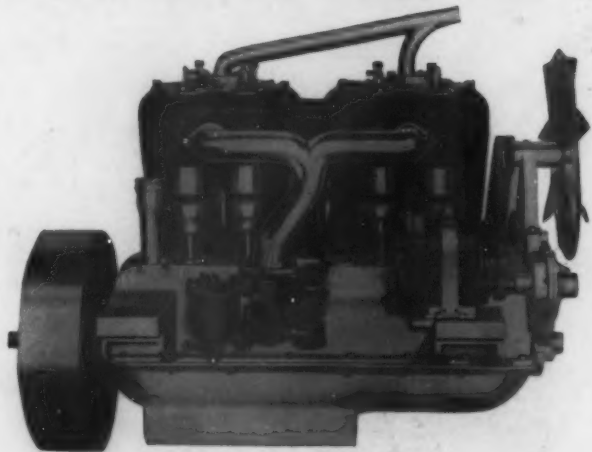
MOTORS

No type of motor, unless specially built, can withstand the continuous and grueling service of the motor truck.

The commercial car is at work all the time—in many cases day and night—and must, therefore, have a consistent, dependable and durable power plant.

The Wisconsin is specially designed and built for motor truck service—and judging from its continued popularity and ever-increasing demand by truck makers, users and dealers, it may be justly termed—

"The Consistent Truck Motor"



Wisconsin Type A—4 $\frac{3}{4}$ " x 5 $\frac{1}{2}$ "

We invite inquiries from truck and tractor makers, who require the utmost in power and who build a truck in which is embodied the best obtainable parts and units.

Our new factory, of steel and concrete, covers over 90,000 square feet of floor space and it is devoted exclusively to the production of Wisconsin Motors.

Send for catalog, illustrating and describing the most complete line of gasoline motors in America.

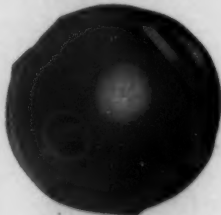
Wisconsin Motor Mfg. Company
Milwaukee, Wisconsin, U. S. A.



TRANSIMETER

(Hub Odometer)

Approved by a prominent concern which profits through keeping accurate mileage records. Read what Peter Doelger Brewing Co. says.



"Dreadnought" Type

Special TRANSIMETER Features:

- 1—Grease and dust-proof; figures always legible.
- 2—Figures do not revolve—always right side up.
- 3—Steel pin connection between axle and mechanism.
- 4—"Dreadnought" Type guaranteed indestructible.
- 5—"Applied" Type attachable to any truck or car.

Write for folder and prices

Mrs. of Popp & American Taximeter Co. 7th Ave. and 49th St.
Jones Taximeters NEW YORK
Service Stations in the following cities: San Francisco, New Orleans, Washington,
Chicago, Detroit, Philadelphia, Seattle, St. Louis, Boston

Trucks of Peter Doelger Brewing Co., equipped with "Dreadnought" TRANSIMETERS.



Peter Doelger
BREWING COMPANY, INC.

New York
January 11th, 1915.

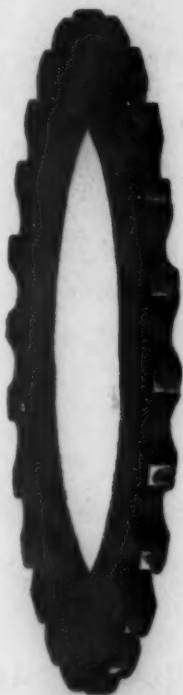
American Taximeter Co.,
7th Ave. and 49th St.
New York City.

Gentlemen:

We are using practically a full equipment of your indestructible Hub Odometers on our seventy-one motor trucks, and are pleased to state that our experience with the Transimeter, after having experimented with all types of Hub Odometers, is that it is by far the most superior mileage recording device manufactured.

An accurate record of mileage is indispensable in the economical operation of our automobiles, and the only means that we have found to date is the Transimeter.

Yours very truly,
PETER DOELGER BREWING CO., Inc.
(Signed) C. M. Geiger,
Traffic Manager.



CULLMAN SPROCKETS and Differentials

in stock and to order.

Send for catalog and let us quote you on your requirements.



CULLMAN WHEEL COMPANY, CHICAGO
1351 GREENWOOD TERRACE

When Writing, Please Say—"Saw Your Ad. in the C C J"

The ***SPEEDOGRAPH*** Tells

Just What Your Truck Was Doing Every Minute Every Day

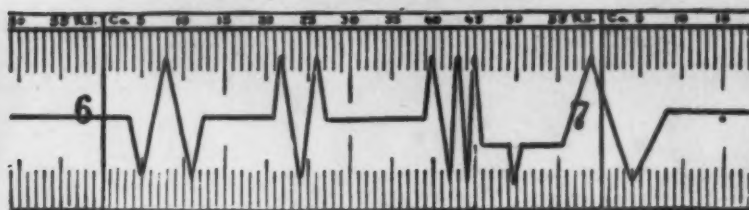
*Time, Distance and Speed of Every Run
Every Stop and Its Time and Duration
Rate of Speed at any Given Time
Mileage Per Trip, Day or Year*

You must have such information to prevent waste and abuse, and to obtain efficient, economic service.

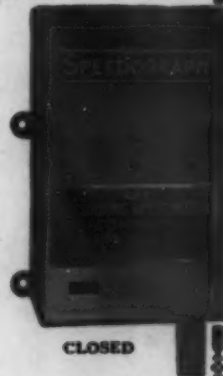
THE SPEEDOGRAPH SAVES
Time — Tires — Gasoline — Repairs — Money



OPEN



Facsimile of Record
Accurate, Clear and Legible



CLOSED

The tape is divided into hours and minutes, and the record line shows every movement of the vehicle.

Write for catalogue and prices

The Speedograph Sales Corporation General Distributors No. 11 Broadway, New York

Russel

Internal Gear Drive Axle



Internal Gear Drive Axle

RUSSEL MOTOR AXLE COMPANY, North Detroit, Michigan

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Sell This Line of **KREBS** TRUCKS

It is an easy and profitable line to sell, because the trucks have



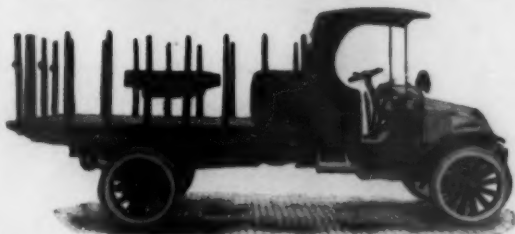
Model E, 1/2-Ton Truck

Our Remarkable Automatic Governor



Krebs Model G, 1-Ton

Timken-David Brown Worm Drive



Model H, 2-Ton Truck

High-Grade Constructional Units

The Krebs line offers advantages which are not found in any other truck. They are economical, powerful, durable, efficient, and are highly successful wherever used. Let us show you why you should sell the Krebs.

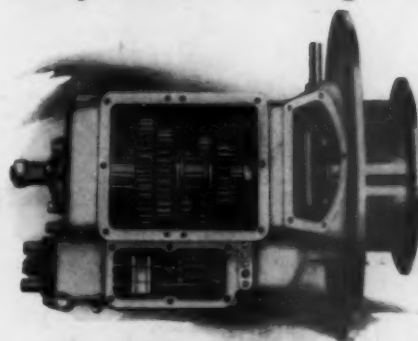
The Krebs Commercial Car Co.
Clyde, Ohio

WARNER "THE RECOGNIZED STANDARD"

WARNER GEAR CO.
TRANSMISSIONS **NEVER**
FAIL. THEY GIVE LAST-
ING SERVICE AND SURE
SATISFACTION.

IF THERE IS A
WARNER TRANSMIS-
SION IN **YOUR** TRUCK
BE PROUD OF IT. YOU
HAVE REASON TO BE.

They Have No Equal



MODEL 55, 4-SPEED UNIT TYPE
WITH CENTER OR SIDE CONTROL

FOR

1-2 Ton Worm Drive Trucks

**TRANSMISSIONS
STEERING GEARS
DIFFERENTIALS
CLUTCHES**

Warner Gear Co.
MUNCIE, IND.

BRANCH OFFICE, FORD BUILDING
DETROIT



Part of Fleet of 11 Stewarts in the Service of the Buffalo News

Stewart Delivery Trucks

A New Policy for Dealers

Our dealership proposition is an unusually liberal one. We do not require dealers to put up a lot of deposit money, and contract for a big number of trucks.

With our increased facilities, which mean larger output, we so arrange our schedule as to have a certain number of trucks ahead at all times. Thus, we can assure prompt deliveries.

Write today and find out how it will be to your advantage to handle the 1500-lb. Stewart.

Stewart Motor Corporation, Buffalo, N.Y.

T. R. Lippard, Pres.

R. G. Stewart, Vice-Pres. and Chf. Eng.
R. P. Lentz, Sec. and Treas.

ROSS STEERING and DIFFERENTIAL GEARS

are standard on good
motor truck
construction

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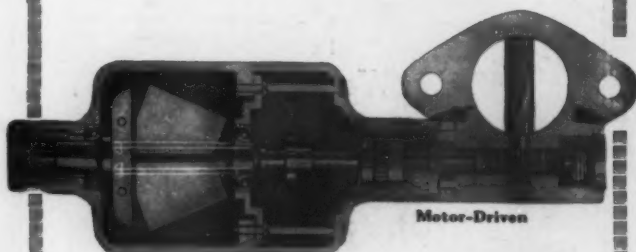
ROSS GEAR & TOOL CO.

790 Heath St.

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Lafayette, Ind.

PIERCE Motor Governor



**Pierce Speed Controller
Company**

ANDERSON, IND., U. S. A.

Flint

1600-2000 Lbs. Capacity



Another Satisfied User


C. E. Brandt & Company, Wholesale Paper and Twine Dealers, Flint, Mich., writes: "Because of the service your 'Flint' Truck has been giving us, we feel you should know how well we are pleased. It is doing the work of two horse-drawn vehicles, sometimes three. In service six days a week without any trouble. Loads run from 1200 to 2000 pounds. Averages 12 miles to gallon gasoline, and 100 miles to gallon oil."

This is the sort of service that is built into all "Flint" Trucks. They satisfy both user and dealer.

FLINT MOTOR WAGON DEPARTMENT
DURANT-DORT CARRIAGE COMPANY, FLINT, MICH.

**GUARANTEED
ONE YEAR**

HERZ PLUG




The reasons for HERZ PLUG'S superiority to ordinary makes are definite and obvious.

The insulation is **DOUBLE STONE**. The electrodes are **PLATINUM-ALLOY**. There are **FOUR SPARKING POINTS**. HERZ PLUG is **SELF-CLEANING**. It is **GUARANTEED A FULL YEAR**.

Price, \$1.50. Order from your dealer or
HERZ & CO., 245 W. 55th St. (near Broadway), New York

Stegeman

Special Truck for Country Roads



Made in all sizes up to 3-Ton

We build a **Special Truck for Country Road Service**, narrow (wagon) gauge, high wheels, single tires, enclosed drive, low center of gravity, etc.

The "regular" or wide gauge truck used in cities won't do in Country service because they can't travel the narrow, soft bottom, rutty roads satisfactorily or economically.


We Make the Truck to Fit the Roads

Brewers, Oil Companies, Bottlers, Dairies, Lumber Dealers, etc., etc., have been using them for over four years and find them indispensable. Send for special literature on this truck, full particulars, testimonials and list of users.

AGENTS: There is a large field for this class of machine and you will have no competition. Let us hear from you.

STEGEMAN MOTOR CAR CO.
MILWAUKEE, WIS.

**ROWE
MOTOR TRUCKS**



are used in every line of business and in every case have proved the most economical means of hauling.

A Rowe Truck will save you money in transporting your merchandise.

The Rowe Truck is guaranteed to give

Continuous Economical Operation

Worm or chain drive. One to five tons capacity

Rowe Motor Manufacturing Co.
Downingtown, Pa.

**RYERSON REINFORCED
GLYCO PATENTED SKELETON CONSTRUCTION
BEARINGS**

for automobile, motor boat, tractor and stationary gas engines and other machinery where a removable and quickly replaceable bearing is desired.

Finished Bearing



Reinforced and interlocked throughout body and flanges—skeleton and Babbitt one homogeneous mass.

Demand Ryerson Reinforced Bearings in those vital parts of your engine—the connecting rod and main shaft bearing. The whole engine is no stronger than its weakest part. Inferior bearings make an inferior engine.

JOSEPH T. RYERSON & SON
Iron Steel Machinery
Chicago New York St. Louis

Section showing reinforcement



Steel or bronze skeleton, used in combination with whatever Babbitt metal is preferred.

No Truck Will Show a Saving Unless It Is Kept in Service.

Motor trucks cannot show saving over horse-drawn vehicles unless they are kept in constant service.

Equip your trucks with long mileage tires and be sure they are demountable.

United States Motor Truck Tires

DEMOUNTABLE

United States motor truck tires may be changed by your own man either in your garage or on the road. They are long mileage tires and the men who have had the longest experience with motor-truck hauling concede them to be the leading tires for motor trucks.

United States Tire Company
Broadway at 58th Street
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Spicer Universal Joints



Universally Accepted as the Most Dependable Flexible Connection Known to Motor Car Practice

Oil-Tight Dust-Proof

PARTS INTERCHANGEABLE

Spicer Manufacturing Company
Plainfield, N. J.

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ESTABLISHED 1909

INCORPORATED 1914

SIX YEARS OF SUCCESS

The United States Motor Truck Co.

Cincinnati, Ohio

OFFERS A FINE OPPORTUNITY TO DEALERS

GET OUR PROPOSITION



Made in
2, 2½, 3 and 4 ton
Capacity

THE correctness of its construction combined with best quality materials and right prices, make the U. S. a splendid value for buyers and a good proposition for dealers.

SPECIFICATIONS AND PRICES ON REQUEST

Watch Your Brakes

When a truck won't run, you lose time. When it won't stop, you are apt to lose the truck. Which is more important?

Keep the truck running by all means—that's what it's for. But don't forget the brake linings.

A lot of brake linings are not reliable. When the outside coating wears off they become worthless—friction-shy.

Thermoid HYDRAULIC COMPRESSED Brake Lining - 100%

Brake lining, to be 100 per cent., must be brake lining all through. Not merely on the outside. It must be trustworthy to the last.

Thermoid retains its 100% gripping power even until worn paper-thin. Hydraulic compression makes it one solid, single substance of uniform density clear through—instead of being loose and stringy (and friction-shy) on the inside, as is ordinary woven brake lining. Guard YOUR truck with Thermoid.



Thermoid Rubber Company

TRENTON, N. J.

Our Guarantee: Thermoid will make good—or WE will

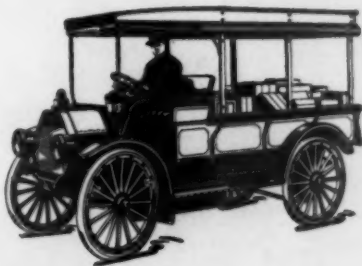
The Greatest Truck Success

In these horseless times, when streets and roads are just about alive, so to speak, with motor trucks, and nobody doubts the great efficiency, economy and profit of truck over horse, it is only the best trucks that succeed in getting a hearing.

INTERNATIONAL MOTOR TRUCKS

in spite of the great competition, keep things humming at the largest factory in the world, building motor trucks exclusively. Isn't that significant? The capacity of the factory has been increased every year during the eight in which we have been selling this most dependable of all light trucks.

Write for catalogues and learn the reasons that stand back of this phenomenal growth.



International Harvester Company of America

(Incorporated)

182 Harvester Building

Chicago U S A

WAUKESHA

4-6% LONG STROKE TRUCK MOTOR

THE Waukesha Long Stroke Truck Motor is designed solely to meet the requirements of truck service and so solves with maximum efficiency the truck user's delivery problem.

It is the truck manufacturer's strongest justification for re-orders. Its positive, definite, unvarying efficiency under all working conditions gives the purchaser of the first truck a totally new idea in truck service that makes your hold on his future truck requirements a foregone conclusion.

Exclusive processes in metals used give the Waukesha strength unapproached by any other motor. The crankshaft has a tensile strength of 140,000 lbs. to the square inch. The bearings have greater resistance than the best Parsons' White Brass. The unusual strength of these two features is but an index to the character of the motor as a whole.

As a progressive manufacturer of trucks you should at least know all about the Waukesha. Your request will bring full information.

WAUKESHA MOTOR CO.
WAUKESHA Dept. A. WISCONSIN

AN EXCEPTIONAL MOTOR

GEARS

GEARS

Bevels Mitres Worms
Spurs Spirals Racks
Sprockets

We produce in quantities to specification cut and planed Gears and Pinions of all descriptions. As a source of supply in connection with Gear and Gear Cutting, we are considered an asset by many of the best interests. They buy from us year after year, because these advantages are afforded:

- (1) Unexcelled facilities.
- (2) The highest standard of workmanship.
- (3) Years of experience as specialists in gearing.
- (4) A most careful selection of materials.
- (5) Particular attention to deliveries.

THE VAN DORN & DUTTON CO.
Gear Specialists
CLEVELAND (Sixth City)

GEARS

CANDLER TRUCK RADIATORS

Thoroughly Reinforced



Unusual Strength—High Efficiency

The Candler Special Truck Radiator is the strongest construction on the market to-day. It is highly adapted to truck use, by virtue of its efficiency, strength and durability, non-leakable and non-freezable features as well as its ease of repair.

We invite correspondence from those interested in a Practical and Serviceable Truck Radiator.

CANDLER RADIATOR COMPANY
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**GEAR
BRONZES**

CRAMP

**BEARING
METALS**

The best motor cars and trucks, those famed for their sturdiness and long service, boast the **CRAMP METALS**. The world's greatest battleships have spread the fame of **CRAMP METALS** world wide. The high standard of precision, accuracy and quality set in these battleships is not approached in any other engineering feats. Everywhere and every day **CRAMP METALS** become a part of some great commercial enterprise, simply because their quality is known. Why experiment? Specify—

"CRAMP BEARING METALS AND GEAR BRONZES"

The William Cramp & Sons Ship & Engine Building Company, Philadelphia, U. S. A.

BUCKEYE Motor Truck Jacks

Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

No.	Height Bar Down	Raise of Bar	Height Bar Up	Weight	Capacity	with formed handles	List Price
7	11 1/4"	6 1/4"	18"	18 lbs.	2 1/4 tons		\$10.00
13	14 1/4"	7 1/4"	20 1/4"	25 1/4 "	3 "		15.00
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THE BUCKEYE JACK MFG. CO., Alliance, Ohio



The NEVER-SKID FOR MOTOR TRUCKS

PREVENTS SKIDDING

GIVES TRACTION

Used by U. S. Government,
Brewers and Motor Truck Manufacturers throughout the U. S. and Canada

NEVER-SKID MANUFACTURING COMPANY
798 Tenth Avenue, New York

**FRAMES
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THE PARISH & BINGHAM CO.
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Our
Entire
Engineering
Force is at
Your
Disposal

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BESSEMER TRUCK

Illustration shows Model "C" which is equipped with either pneumatic or solid tires. There is more real sturdiness built into this than in any other one-ton truck on the market.

Three Models		
MODEL C	MODEL A	MODEL D
1 Ton Capacity	1½ to 2 Ton Capacity	1½ to 2 Ton Capacity
25 H. P.—\$1250	30 H. P.—\$1600	Worm Drive 30 H. P.—\$2300

DEALERS: Write us about the special proposition we have for you. The Bessemer line enables you to handle every truck requirement.

BESSEMER MOTOR TRUCK CO.
GROVE CITY, PA.

Pyrene
FIRE
EXTINGUISHERS

A SCIENTIFIC agent which extinguishes every kind of incipient fire—gasoline, and electric, as well as the ordinary kind.

"The Most Efficient Fire Extinguisher Known"

At Leading Dealers Everywhere

Write for Literature

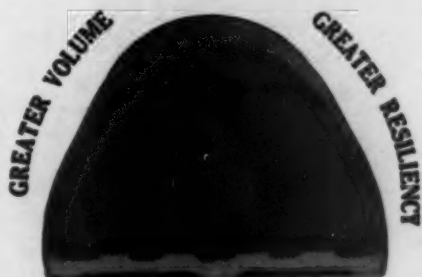
The Pyrene Mfg. Co.
1358 Broadway New York, N. Y.



McGRAW SOLID TIRES

Guaranteed for 10,000 Miles

20% MORE RUBBER 40% MORE SERVICE
00% MORE COST



Pressed-on Type. Endless Steel Base.
Applied by Means of Hydraulic Pressure.
Makes Wheel and Tire One Inseparable Unit.

Your dealer can supply you

The McGraw Tire & Rubber Co.
EAST PALESTINE, OHIO

Gramm's Trucks



appeal to the man who has had experience in the use of motor trucks.

To him their quality points, the individual clutch transmission, guaranteed springs, self-starter, etc., mean a definite saving in operating costs.

The full line, 1 to 6 tons, with all its features, is described in our complete catalog, which will be sent you on request.

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LONG

Cooling Systems

The very fact that a truck is equipped with a Long Cooling System is an indication of a well-made, dependable truck throughout. Long Cooling Systems are something more than radiators, they are systems designed especially to cool the motors with which they are used.

Over sixty-two manufacturers of high-class cars, aiming to keep up a high standard of efficiency and dependability throughout, are using Long Cooling Systems as regular equipment.

Long Cooling Systems are guaranteed to cool the motors for which they are designed. Long Cooling Systems are guaranteed to be free from defects.

Besides the Spiral Tube type, the most rigid, durable and dependable types for heavy trucks are the Cellular, Flat Tube, Honeycomb and Fin and Tube Types.

Write for catalogue describing the different types, methods of manufacture, and terms. Let us send an expert to solve your cooling problems.

LONG MANUFACTURING CO., Detroit, Mich., U. S. A.

"Pioneer Makers of Gasoline Engine Cooling Systems"

G. V. ELECTRIC TRUCKS

SIX MODELS: 1,000 POUNDS TO 5 TONS



Over 4,000 in use
Catalog on request

General Vehicle Company, Inc.



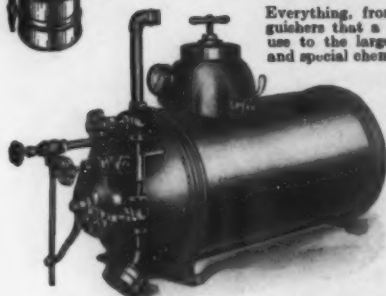
GENERAL OFFICES AND FACTORY:
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DEPENDABLE Chemical Fire-Fighting APPARATUS



Everything, from the hand extinguishers that a woman or child can use to the large Chemical Engines and special chemical tanks for Fire Department service.

Into each is put material and workmanship that cannot be excelled. Designs are shown by actual use to be beyond improvement.

Result: Perfect and immediate action when needed, no deterioration from lack of use or age.

**All Our Tanks Are
Made of Copper**

The name "CHILDS" stands for perfection.

Chemical Tanks for Fire Department or other service made to order.

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O. J. CHILDS CO., Utica, N. Y.
MANUFACTURERS FIRE APPARATUS



PLAIN COMPRESSION
(Patented)

Empress

BRASS AND STEEL

GREASE AND OIL CUPS

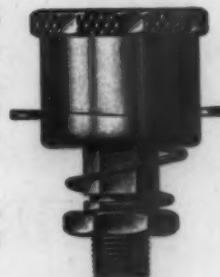
WE MANUFACTURE

a full line of Plain, Leather Packed, Ratchet, Marine, Spring Compression, and many other styles of Grease Cups.

Our line of Oil Cups is equally satisfactory and complete.

Catalogue on Application

Bowen Manufacturing Co.
AUBURN, N. Y.



RATCHET

"Ironclad-Exide"

The Battery for Commercial "Electrics"

"DOING ITS DUTY EVERY DAY"



E.S.B. Co. 532

The "Ironclad-Exide" Battery is in its fifth year of successful service. Its record for the past four years stands as absolute proof of the correctness of its design.

It is unquestionably the battery for commercial service. It is reliable—day-in and day-out—every day in the year. No delays—no fuss—no inconveniences. *Always dependable.*

It is the battery for big loads—rough or hilly roads—*hard service.*

The "Ironclad-Exide" Battery hauls the most for the longest time with the least trouble and at the least expense.

It is economical to use and economical to maintain. *It's good when new and it stays good.* It's a business battery for business men.

It is used by the largest electric vehicle users in the country.

These are our claims for the "Ironclad-Exide" Battery. More convincing, however, is "*what the other fellow says.*" Get a copy of the new "Ironclad-Exide" testimonial book. It contains letters from vehicle owners who have used one or more "Ironclad-Exide" Batteries for three years or over.

THE ELECTRIC STORAGE BATTERY CO.

Manufacturer of

The "Chloride Accumulator", The "Tudor Accumulator"
The "Exide", "Mycap-Exide", "Tbin-Exide" and "Ironclad-Exide" Batteries.

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APELCO



AMMETER

Electric Starting and Lighting System for Ford Cars

"The most compact—the most serviceable for the *Ford* owner" has been the designing and manufacturing dictum, while absolute utility has been the keynote for the strenuous and exhaustive tests the system has undergone to pronounce its fitness for hard service.

In unique features of construction and application—**absolutely no machine work is necessary to make an installation**—the manufacturers of the APELCO outfits have satisfied themselves with the merits of their *Ford* Starting and Lighting unit.

**Everything an Owner Needs
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Send or write for a fully illustrated booklet

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MOTOR
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IN ONE UNITAUTOMATIC
SWITCHLIGHTING
GENERATORMOTOR
AND
STARTING
SWITCHGENERATOR
AND
TIMER
DISTRIBUTOR



A Hard Run Over Seattle Hills

These two pay-as-you-enter Lippard-Stewart 'Buses operate between Seattle and Foster, ten miles over hills. A car of great ability and endurance is needed. A steady run of this kind is a severe test. A Lippard-Stewart is especially suitable for this work, owing to the silent and smooth power application that comes with the Lippard-Stewart Worm Drive.

Speed-Endurance-Appearance

Over 40 different business concerns of standing use two or more Lippard-Stewarts. Many have sent reorders after competitive tests with other cars.

You need different sizes of trucks to save the waste in overloading and underloading. A fleet of Lippard-Stewarts simplifies garage and maintenance costs.

What the Worm Drive Saves

Flow of power is continuous and smooth, saving fuel, saving wear and tear of mechanism, saving loss of power; general life of trucks is longer; operating expense is less. The great efficiency of Lippard-Stewart Trucks and the low operating expense records they make are due in a large part to this successful application of the worm drive.



Many ice cream companies use Lippard-Stewart Worm Drive Trucks, not only for speed and economy, but because salt water does not create disaster as it does on trucks that employ jack shaft, sprockets and chains, where the salt water inevitably corrodes exposed parts in a way that makes their replacement too frequent. The worm drive is enclosed in an oil-tight case, thoroughly protected from outside elements.

Lippard-Stewart
MOTOR TRUCKS
Radiator at
Dash, Our
Dealers' Sign

1/2 Ton, 3/4 Ton, 1 Ton, 1 1/2 Ton, 2 Ton

Catalog and Special Information for Owners
and Dealers. Requests for Catalog
must be on Business Letterhead

Lippard-Stewart Motor Car Co.
237 W. Utica St. Buffalo, N. Y.

When the Salesman Says "Continental"

The salesman says "Continental." Or, "Continental---of course."



A single phrase,—yet expressing everything that may be said in praise of a motor.

Like "Sterling" as applied to the silversmith's masterpiece, it needs no further qualification. For, like "Sterling," the former trade-name "Continental" has become a world-wide symbol of unsurpassed quality.

Continental Motors

When the salesman says "Continental" he implies infinitely more than the splendid piece of motor mechanism before him; he summons up a picture of the greatest motor-building organization in existence—the most conspicuous success of specialization in the automobile industry.

With a word, he describes the perfection of an idea,—the idea that by doing one thing only, and doing it well; by holding intact an organization of men who have the training; by the developing of special equipment; by fair play, good wages and undivided enthusiasm, a product better in every way can be assured.

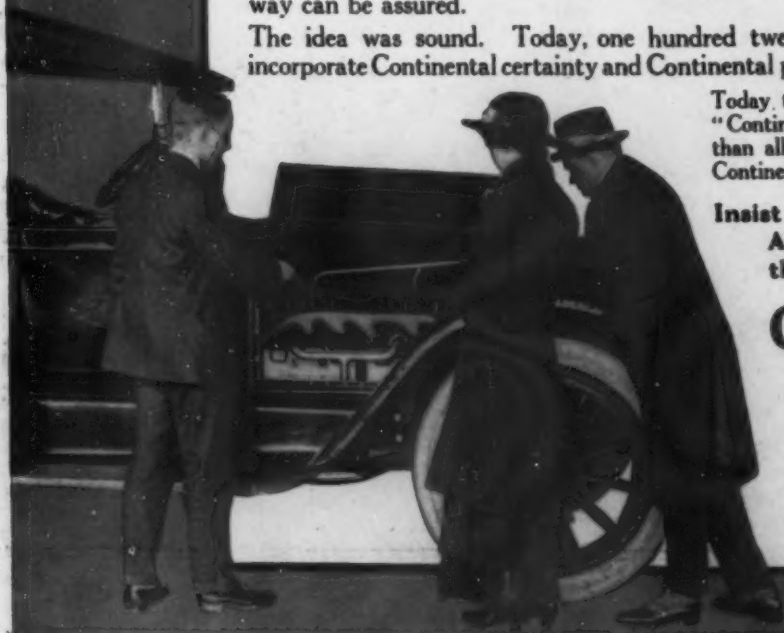
The idea was sound. Today, one hundred twenty-eight manufacturers incorporate Continental certainty and Continental prestige into their product.

Today, the good will of the very name "Continental" is worth even more than all the millions invested in the Continental factories and equipment.

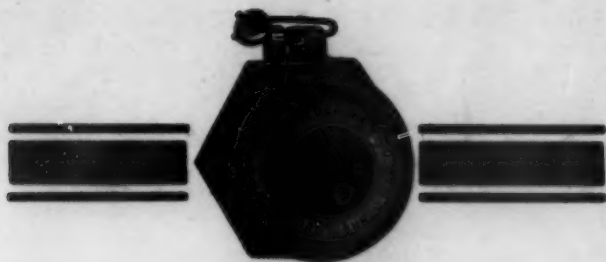
**Insist upon a Continental—
America's Standard—in
the next car you buy.**

**Continental
Motor Mfg.
Company
DETROIT, MICH.**

**FACTORIES:
DETROIT MUSKOGON**



When Writing, Please Say—"Saw Your Ad. in the C C J"



Your Profit Account

demands that you use a

Veeder HUB ODOMETER

Little things play a prominent part in creating or destroying profits. In many cases it is only by stopping leaks and paying close attention to details that a profit can be shown.

This particularly applies to motor truck deliveries. It is so easy to waste time, money and gasoline that unless great care is exercised the truck will become unprofitable.

It is because the Veeder enables you to keep accurate track of what your truck and its driver are doing that your profit account needs its installation on your trucks.

The Veeder records with absolute accuracy the exact distance which has been covered. Its record cannot be altered, or falsified without instant detection. It records forward whether the truck moves forward or backward. It affords a check on your drivers which enables you to weed out the inefficient, careless and crooked ones. It enables you to know whether you are getting all the service you should out of your truck and the various guaranteed parts and accessories.

Put a Veeder on each of your trucks and you take an important step toward increasing your profits.

At your dealer's, direct from factory, or the following:

T. H. CRANSTON & CO., 56 E. Randolph St., Chicago
BERNARD I. BILL, 543 Golden Gate Ave., San Francisco, Cal.

The Veeder Manufacturing Company

C. H. VEEDER, President D. J. POST, Treasurer
H. W. LESTER, Secretary

Hartford, Conn.

Makers of Cyclometers, Odometers, Tachometers, Tachodometers,
Counters and Small Die Castings

DENBY

Denby trucks are fitted to a business—not tacked on to it.

It takes trained men, with skill and experience in solving haulage problems, to make this adjustment.

Our Traffic Efficiency Department is made up of such men—and their advice is yours for the asking.

That's why every Denby truck in use is the best possible argument for the sale of another.

Denby Motor Truck Co., Detroit

COVERT TRANSMISSIONS



Of the Highest Quality

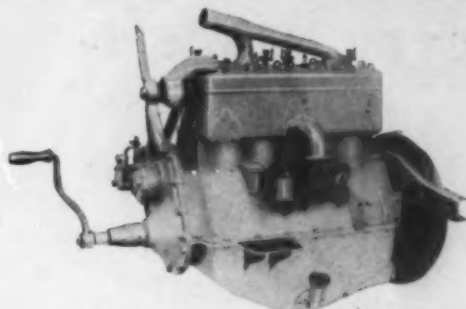
Covert Transmissions are the result of many years' successful transmission building—today they are recognized as the best—not only in point of service and durability but also in regard to quietness and all-around efficiency.

Made in various models for different sizes and types of cars—Covert Transmissions will free you from transmission troubles. Let us show you how they fit your construction.

Covert Motor Vehicle Co.

SALES OFFICE
Detroit, Mich.

FACTORY
Lockport, N. Y.



Model 20, 3 1/2 x 5, 4 cyl.—30-35 H. P.
For Trucks of 1/2-1 1/2 Ton Capacity

THE RUTENBER MOTOR

Model 20 is an entirely new design for 1915. It is a very efficient, high-speed motor, with extra large bearing surfaces and possesses a unique combination of features which appeal strongly to commercial car makers. While this is a motor that embodies the highest grade material and workmanship as has for many years been characteristic of Rutenber products, it is one of simple and plain design that permits of very low quantity prices. We invite your inquiries.

The Rutenber Motor Company
Marion - - - Indiana

FORGINGS

We specialize on Drop Forgings and are prepared to give unexcelled quality and service to manufacturers of trucks and automobiles on large or small orders for

Crank Shafts I-Beam Front Axles
Cam Shafts Connecting Rods
Levers, etc.



When in need of any of these parts, consult us and let us quote on your requirements before you place your orders.

Western Drop Forge Company
Marion, Indiana

LAVIGNE STEERING GEARS

The name that symbolizes quality is—LAVIGNE.

The name of the most popular steering gear in the truck world is—LAVIGNE.

The name that stands for service and satisfaction is—LAVIGNE.

The name that helps to sell trucks is—LAVIGNE.

The name that should receive your first consideration when selecting steering gears is—LAVIGNE.

Data sheets and information on request

LAVIGNE GEAR CO.

Racine - - - Lock Box 324 - - - Wisconsin

EISEMANN

Automatic Spark Control
Increased Truck Efficiency

NO type of magneto is so peculiarly adapted to the demands of commercial vehicles as the Eisemann models equipped with Automatic Spark Control.

If you do not know about this exclusive Eisemann feature—if you do not know about all of the other exclusive Eisemann features—get in touch with us to-day.

Eisemann products on your trucks mean increased efficiency and decreased up-keep.

The Eisemann Magneto Co.

Sales and General Offices

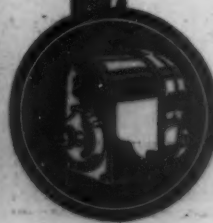
32-33rd Street, Brooklyn, N. Y.

New York City, 123 West End St.

Indianapolis, Ind.,

514 North Capital Avenue

Detroit, Mich., 602 Woodward Ave.



When Writing, Please Say—"Saw Your Ad. in the C C J"

3
Models1
Price

Model S-C



Keep your eye on the steady progress of
this splendid sales proposition.

Continental Motor, Eisemann Magneto
Sliding-Gear Transmission.

For Profit's Sake, Investigate

The Commerce Motor Car Co.

753 Penobscot Building
Detroit, U.S.A.

ON THE JOB EVERY DAY

Day in and day out the year round your truck must be ready to do its work and do it at the least possible expense.

Selden Trucks

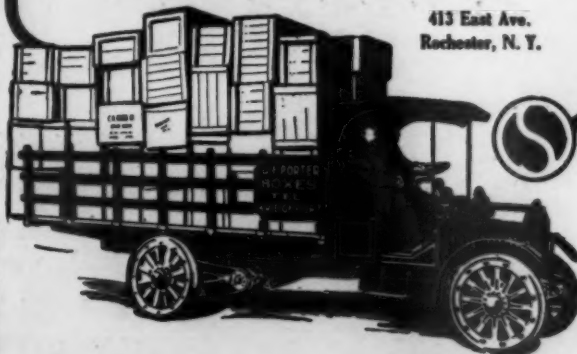
have invariably given this kind of daily service to their owners because they are built to stand the strain of continuous work. Every working part to the last bolt is larger and stronger than corresponding parts of any other 3000-lb. truck. We invite comparison.

\$500 Puts the \$2000 Selden Truck into Service

The balance may be paid at the rate of \$125 per month. The Selden Sales Plan as indicated above has proven very satisfactory to users and dealers alike. It will pay you to investigate the true merit of the Selden Truck and the plan by which it is sold.

SELDEN TRUCK SALES CO.

413 East Ave.
Rochester, N. Y.



Herewith is shown a fleet of six 7 ton trucks equipped with the Improved Wood Hydraulic Hoist and Steel Dump Bodies in the service of the Bay State Transportation Co., of Fall River, Mass. These outfits are hauling 7 1/2 gross tons of soft coal which is equal to 6 1/2 net tons per load.

Wood Hydraulic Hoist and Body



THE illustration herewith shows the latest Improved Wood Hydraulic Hoist and our Standard Sand and Gravel Steel Dump Body, as applied to a truck chassis.

You will note at once the clean-cut and integral appearance of the outfit, and the extremely large lifting member or Piston Rod (the Vital Factor) with which it is equipped.

The Wood Hydraulic Hoist and Body

Solves the dumping problem

Leading truck manufacturers are using the Wood as standard equipment on all dumping outfits.

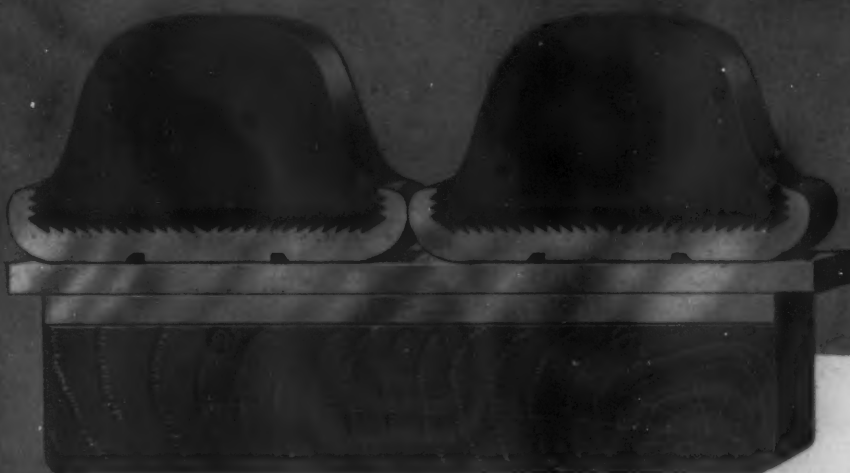
Its simplicity, adaptability and efficiency appeal to everyone.

Write for illustrated literature

WOOD HYDRAULIC HOIST AND BODY CO.

560 Franklin St., Detroit, Mich.

When Writing, Please Say—"Saw Your Ad. in the C C J"



GIBNEY

PRESSED-ON

WIRELESS TIRES

Motor truck users find in the two types of Gibney Wireless Tires shown on this and the following page the ideal tires for economical and long-continued service.

There are very definite and logical constructional reasons for this, beginning with the selection of materials and running through the gamut until the finishing touches are applied.

While these reasons are in themselves convincing, we are not content to rest our case on them, for any tire maker can—and most of them do—claim superiority for their tires.

Most claims wither away before the tests of service. Hence we offer you the *proof* of superiority in the statements of many large and reputable concerns who have supplanted almost every make of tire with the Gibney and found the latter gave so much longer and better service that there was no real comparison between them. This evidence is conclusive—you may have it on request.



GIBNEY TIRE & RUBBER CO.

Factory, Conshohocken, Pa.

BRANCHES

Philadelphia, New York, Boston, Detroit, Chicago

AGENTS

Washington, Baltimore, Wilmington, Harrisburg, St. Louis,
Cleveland, Kansas City, Minneapolis

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GIBNEY

DEMOUNTABLE

WIRELESS TIRES

The dealer having an exclusive agency for Gibney Tires finds an already very profitable business made even more so by the recent addition of the demountable type to the line.

This increases his field of prospects; for, while many users prefer the pressed-on type, there are others who, through conviction or lack of convenient facilities for applying the latter, insist on having the demountable type.

Thus he is now prepared to meet either demand with the best tire of its type procurable. The demountable is identical in construction with the pressed-on type, the only difference being in the method of application. The demountable type is unexcelled in its ease of application or removal.

If you want a real money-making tire agency, write for the Gibney proposition. It is the best you can find, because it creates immediate profits and builds permanent business. The best proof of this lies in the record Gibney Tires have made wherever introduced. All the facts in the case are yours on request.



GIBNEY TIRE & RUBBER CO.

Factory, Conshohocken, Pa.

BRANCHES

Philadelphia, New York, Boston, Detroit, Chicago

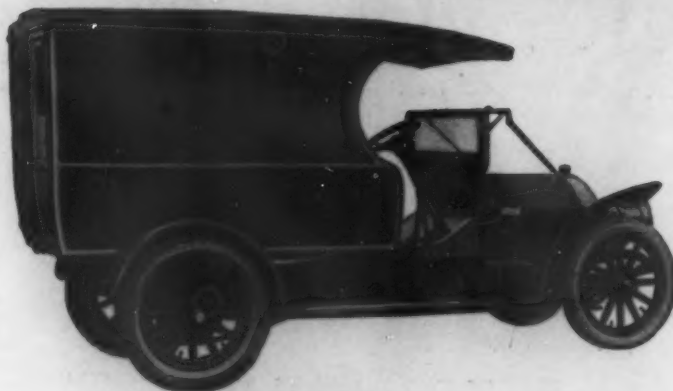
AGENCIES

Washington, Baltimore, Wilmington, Harrisburg, St. Louis
Cincinnati, Kansas City, Minneapolis

Highland Standard Bodies

FOR

LIGHT CHASSIS



Full Panel Body

We manufacture a complete line of Standard Bodies for Light Commercial Vehicles, which are adaptable for use on touring car chassis.

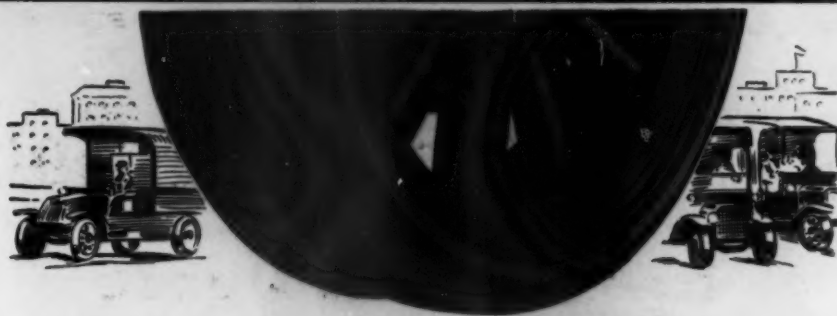
Having standardized the design, we carry a large stock of bodies and finished material, so are prepared to make prompt delivery on Bodies for every service and to fit any Chassis.



Open Express Body

Send for Catalog No. 10, Light Chassis; Catalog No. 14, Heavy Chassis;
Catalog No. 15, Ford Chassis

The Highland Body Manufacturing Co.
Cincinnati, Ohio



What Wrong Tires Do

These 1915 Goodyear S-V Truck Tires Overcome

Learn the results of 2,100 actual tests of 1915 Goodyear S-V Truck Tires. See why a growing host of truck owners hails these tires as the conquerors of the road.

Note how they are pressed onto the felloe band—at a minimum of 50,000 pounds.

And this pressure far exceeds any strain possible in service.

Thus the Goodyear S-V Tires end creeping. And they cannot be thrown from the wheel.

They save the cost of heavy metal bands, bolts, wedges and flanges. They end all preliminary work on wheels. No other tire goes on like these—in 5 or 10 minutes—without a single auxiliary fastening. Hence they save the expense of carrying excess weight below the springs—over thousands of miles.



Wrong Tires Bulge and Break
S-Vs End This Trouble

tires. The resilient rubber tread, the hard rubber backing and steel channel base are welded into one. Our secret process makes this union last throughout the life of the tire.

Give Extra Mileage

Wrong tires bulge—unnatural displacement soon breaks them.

S-V Tires never do that. For the S-V shape—like an ancient pillar—distributes the heaviest load equally.

And they give you 10% more available tread rubber than most other makes.

No "Lay-Ups" Now

Goodyear S-V Tires end truck tire troubles.

Hence they stop dead losses that accrue when trucks are laid up by wrong

Hence greater mileage and lower cost per tire-mile.

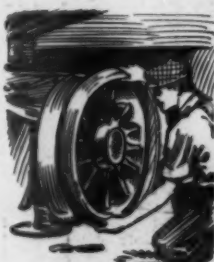
All makers have striven to solve these baffling problems. Goodyear experts—after 8 years of costly attempts—alone have completely triumphed.

We built, to achieve this, 74 separate truck tire structures in this one type alone. Each overcame some towering obstacle. And the 1915 S-V reaches the summit.

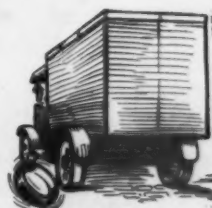
Write for Cost Records

Let us send you full particulars and definite figures from truck users who compared results.

No need to pay the penalty of wrong truck tires. Let the cost book say which tire you shall specify. Address today



Wrong Tires Lay Up Trucks
S-V Keeps Them Going



Wrong Tires Creep and Are Thrown
S-V Tires Never

GOOD YEAR
AKRON, OHIO
S-V Truck Tires

THE GOODYEAR TIRE & RUBBER CO., Desk 94, AKRON, OHIO

Makers of Goodyear Automobile Tires. We Make Demountable, Block, Cushion and Other Types of Truck Tires

(2300)

When Writing, Please Say—"Saw Your Ad. in the C C J"

The Next Issue
MARCH 15th

Will Feature
DUMPING BODIES

The commercial car has introduced many new practical and novel types of dumping bodies and the **March CCJ** will be interesting to readers and profitable to advertisers. If not a subscriber, order your copy early.

Commercial Car Journal PHILADELPHIA
PENNA.

Two More **FEDERALS**



The 1 1/2 Ton Worm Drive Chassis

1 1/2 Ton Worm Drive
\$1800 Chassis
 F.O.B. Detroit

3 1/2 Ton Worm Drive
\$2800 Chassis
 F.O.B. Detroit

1 1/2 Ton Chain Drive Chassis—\$1800, F.O.B. Detroit

In response to the demand for worm drive equipment in the 1 1/2 ton model and also in a truck of larger capacity we have brought out these two new Federals.

All the dependable and efficient service-giving qualities of the chain drive Federals are combined with the cleanliness and long life of the worm gear drive.

These two noteworthy additions to the Federal line make the Federal even more valuable to motor truck dealers—are you interested?



3 1/2 Ton Worm Drive Chassis

Federal Worm Gearing retains full efficiency as long as it lives and it lives longer than any other form of drive

FEDERAL MOTOR TRUCK COMPANY

Detroit

112-120 Leavitt Street

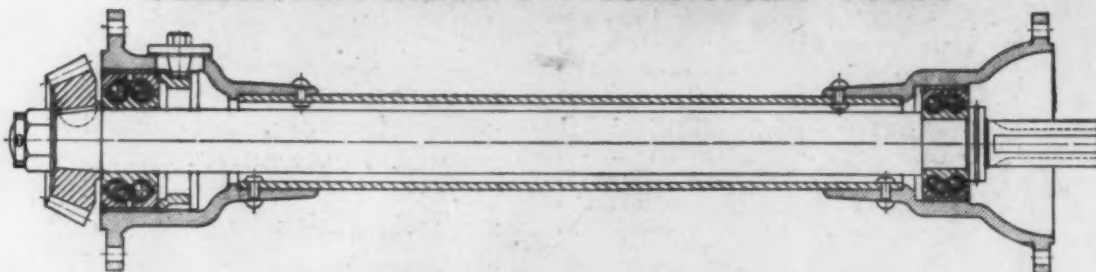
Michigan

When Writing, Please Say—"Saw Your Ad. in the C C J"



NEW DEPARTURE BALL BEARINGS

American Made for American Trade



The New Departure Double Row Bearing

A distinctive patented design, offering many important advantages over other types of bearings.

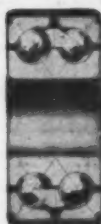
This bearing takes loads from any direction, because the balls carry the loads in angular contact with the ball races.

This is the most efficient and economical bearing for use in 75% of the places where bearings can be used.

We here show an application of the New Departure Double Row Bearing for the first reduction bevel pinion for double reduction three-ton truck axle.

Thus used, the two Double Row Bearings replace two Single Row Bearings and one thrust bearing.

It simplifies machine work, reduces installation expense and insures proper alignment.



ECONOMICAL Motor Truck service requires that no power be wasted in overcoming friction.

The greater the friction the greater the power required to overcome it. Power so diverted is lost.

Excess friction causes rapid wear of rotating parts. That means repairs, replacements and expense.

Ball Bearings reduce friction in far greater degree than do bearings of other types.

Ball Bearings meet successfully the most severe requirements of motor truck service.

New Departure Ball Bearings in the Motor—Transmission—Differential—in the wheel hubs—wherever friction develops, will increase the efficiency and life of your truck and decrease its cost of operation and maintenance.

Our Engineering Department will gladly co-operate with you.



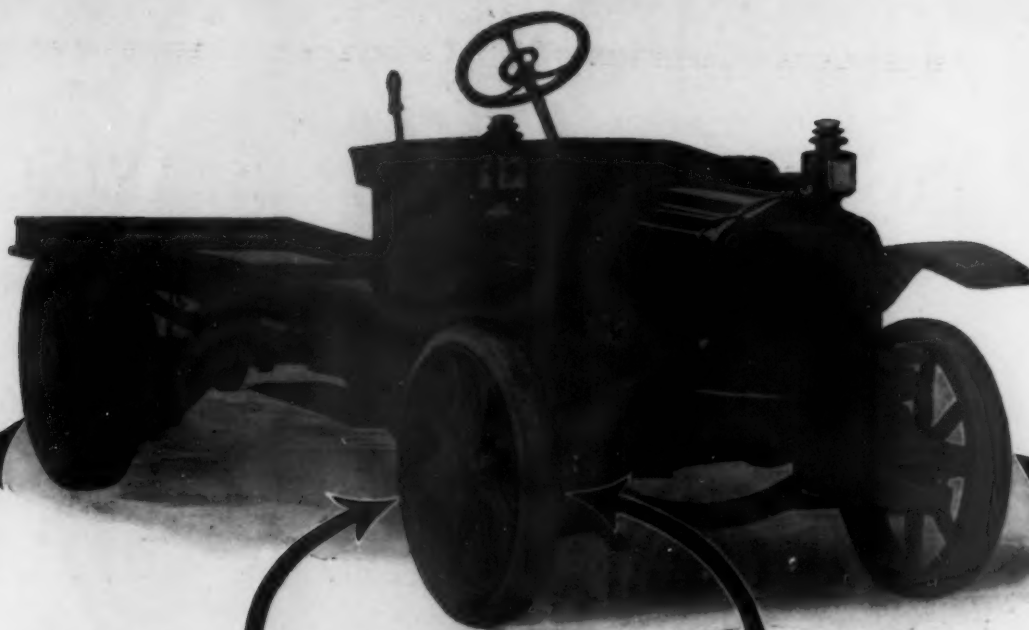
THE NEW DEPARTURE MANUFACTURING COMPANY

Distributors in Trade
Centers Throughout
the United States

Bristol, Conn., U. S. A.

Western Branch:
1016-17 Ford Building
Detroit, Mich.

When Writing, Please Say—"Saw Your Ad. in the C C J"



The trucks you sell will give better service, equipped with

WEST'S CAST STEEL WHEELS

Why? They combine strength and lightness. Weight, 200 pounds less per set on 3-ton cars and 300 pounds less per 5-ton car. These wheels are better than wood, because they last longer, stand more load and strain and cost less (quality considered).

The question of wheels, their strength, weight, ability to carry the load, and durability, is a mighty important one. A careful study of the question will convince you, as it has many others, that the final word in wheel construction is found in West's Cast Steel Wheels. They are lighter than wooden wheels; are not affected by climatic changes; will not warp, twist, shrink or loosen; can stand more strain than other wheels and are far more

durable. They are cast in one piece and have no joints to open or rivets to break. Any truck equipped with them has reliable, economical, indestructible wheels and will be free from wheel troubles.

Get the proof of these things and then tell the maker of the trucks you sell that West's Wheels ought to be on his truck to increase its ability to serve, to make it more salable to your customers, to make the agency more profitable to you, and to increase the prestige of his product.

Let us put the evidence in your hands.

THE WEST STEEL CASTINGS COMPANY
805-815 E. 70th Street CLEVELAND, OHIO

The Value of the A. B. C.

(Audit Bureau of Circulations)

TO THE ADVERTISER

WE explained to you last month the purpose of the A. B. C. and the effective work it is doing. We showed you how, by means of this association, you could absolutely know whether every publication in which you are advertising or contemplating advertising gives you an adequate return for the amount charged.

ARE you making use of this service?

Are you refusing to place business except with those mediums that "prove it"? By concentrating your appropriation on the worth-while mediums, by patronizing the publisher who is really trying to fill his field with a commodity of merit and honesty, you will furnish him with increased revenue to further improve his publication and extend its field of influence, thereby giving you a constantly increasing value for your advertising.

BY just discrimination you will encourage the legitimate publications and discourage those in the field for revenue only — those which are trying to get the most while giving the least possible return.

BUY your space as a commodity. Insist upon proofs of circulation. You would not long patronize a merchant who would insist on your taking his word for the quantity of cloth you were purchasing, for instance, and refused to have it measured. Buy your space the same way

—it's simply business, and business principles can be applied to advertising space and circulation just the same as to any other commodity.

HUNDREDS of the largest national advertisers are now making use of the service of the A. B. C., and are appreciative of the work it is doing. The General Electric Co. has expressed itself as follows:

"The relief we feel at the having of this information automatically, is one that must be shared also by the publisher who has compiled his statement in this standardized form."

THE COMMERCIAL CAR JOURNAL is the only truck journal a member of the A. B. C. The inference is obvious. It has nothing to conceal regarding its circulation figures, and all statements can be confirmed by audit. No doubt in controversy, the time-worn argument will be advanced that it is not the quantity, but the quality of distribution that counts.

THE A. B. C. statement shows the number and kind of readers a publication has, and as the CCJ can offer both quantity and quality, a detailed statement is of equal benefit to advertiser and publisher. When you buy space in the **COMMERCIAL CAR JOURNAL** you know that you are actually getting that for which you pay.

MR. Russell Whitman, Managing Director of the A. B. C., 330 Railway Exchange Building, Chicago, will gladly supply any advertiser or publisher with full details. Better write him today.



Sometimes it takes a year or two for the quality of Fedders Radiators to become apparent. Slowly but surely the absence of heating troubles brings to the motorist whose car is Fedders-equipped the realization that he has a radiator better than the ordinary.

The realization of Fedders Quality brings about satisfaction and there it stops. Complacent satisfaction is the hardest thing in the world to disturb—witness the continued patronage of many leading car makers whose regard for Fedders Quality indicates the opinion of their customers.

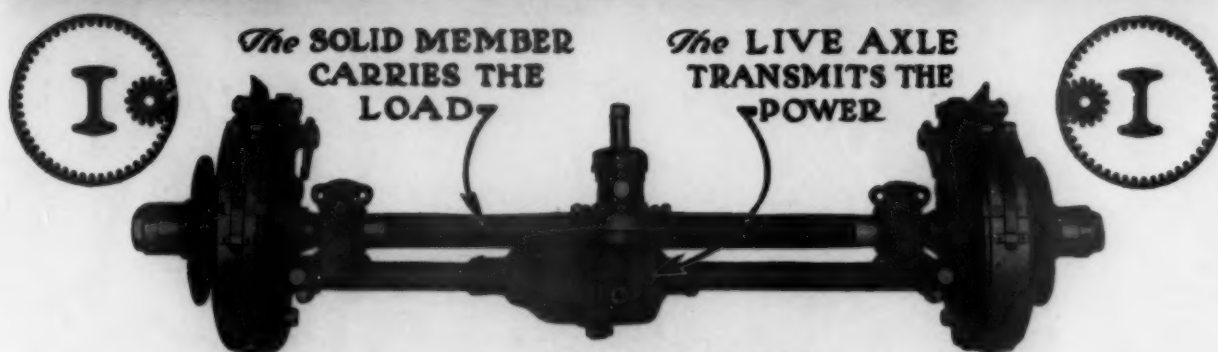
FEDDERS MFG. COMPANY, Inc., BUFFALO, NEW YORK

When Writing, Please Say—"Saw Your Ad. in the C C J"



TORBENSEN

INTERNAL GEAR DRIVE AXLES



Patented March 18, 1902,—July 16, 1912

An advance over all previous types. The principle of this axle is to supply one solid member for carrying the load and a separate one for transmitting the power to the wheel. The carrying member is of drop forged steel with the wheels running on taper roller bearings. The jack shaft, or power transmitting axle, is securely attached to the rear of this forging, and this unit is relieved of all carrying strain by the forged member, leaving the jack shaft purely for the purpose of propulsion.

All of the driving mechanism is enclosed, affording perfect cleanliness, quiet working and efficient lubrication. The internal gear axle has all the advantages of the usual shaft, as well as those of the chain driven type, and the defects of both are eliminated. Simplicity and ease of assembling are salient features.

In the usual form of shaft-driven axle, including the worm type, the tubular housing is depended upon to carry the load, as well as to support the driving axle. This

is the best construction for pleasure car purposes, but for trucks the only satisfactory construction is one where a solid axle supports the load. This is especially essential where solid or cushion tires are used. Chain-driven axles supply the solid support, but the chain requires constant attention, cannot be lubricated and accumulates dirt, resulting in rapid wear and expensive replacements.

Why not get in line with the march of progress? The Torbensen type is the axle of the future. The internal gear drive is the most positive and economical of all methods of power transmission. Truck users no longer have patience with the old wasteful methods. The demand of the hour is for economy and efficiency. Torbensen Internal Gear Drive Axles will bring your truck into the front rank and keep it there.

We have a special proposition for you, Mr. Truck Manufacturer. Write now for complete details and catalogue.

Torbensen Gear and Axle Company

216 to 224 High Street

NEWARK, N. J.

MAKERS OF INTERNAL GEAR TRUCK AXLES EXCLUSIVELY

When Writing, Please Say—"Saw Your Ad. in the C C J"

SPLITDORF

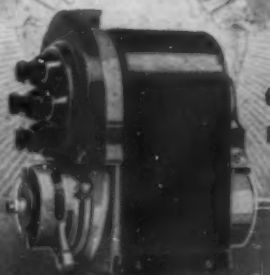
DIXIE
TYPE



MODEL EU4
HIGH TENSION
MAGNETO



CUNNINGHAM
HIGH TENSION
MAGNETO



MODEL EU4-2
HIGH TENSION
MAGNETO



Largest MAGNETO Contract Ever Placed

OVERLAND

ignition for 1916 will
be exclusively

DIXIE

*The Willys-Overland Co. has placed
the largest magneto order ever given
for their entire 1916 output*

Not battery ignition—not the
19th century magneto, but
the 20th century DIXIE

SPLITDORF ELECTRICAL COMPANY
NEWARK, NEW JERSEY

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Linquist Automatic Fender and Brake SAVES LIVES

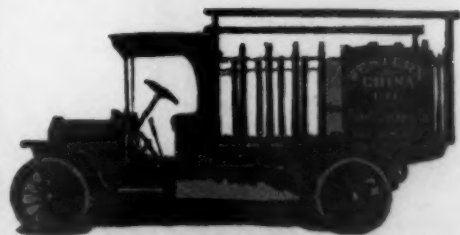
Motor Trucks and all Commercial Cars will eventually be equipped with a dependable fender. City and State laws are rapidly being made to conform with the human cry—Safety First.

The Linquist Automatic Fender and Brake is the most dependable device on the market, and is the one tested out recently with great success by Chicago and other leading cities. It is absolutely automatic in action and self-operating. It automatically drops the fender, puts on the brake and kills the motor, if desired.

Get our illustrated literature—it shows and explains the Linquist Fender in every detail. Truck owners, dealers, and makers—write today. Truck dealers will find this a most profitable seller.

"THE FENDER THEY ARE ALL TALKING ABOUT"

WM. A. LINQUIST, 901-903 Marquette Ave., MINNEAPOLIS, MINN.



DEALERS, ATTENTION!

MODERN
THE BOWLING GREEN MOTOR CAR COMPANY
MODERN
TRUCKS FOR 1915

Standardized thruout, Modern from radiator to tail lamp, built in chain and worm-drive models. Just the truck to get the business in your territory. *Live dealers should write for catalog.*

THE BOWLING GREEN MOTOR TRUCK CO., Bowling Green, Ohio

When Writing, Please Say—"Saw Your Ad. in the C C J"



The Ultimate
Drive

Silent—
Efficient

Watch for a Great Announcement

A most interesting report is being made by one of the greatest manufacturers of automobile trucks in America, telling of the results of the expert work we have been doing with this company for the past year and a half on worm drive.

This report will serve to emphasize what is already generally known—that the Cleveland Worm and Wheel is an unrivaled drive for motor vehicles.

There seems to be much surprise at the good points that the worm and wheel is now developing in actual practice.

There is no mystery about its strength, silence and power: if a great weight is to be lifted or a house moved it is the worm (jack) that does the work.

The worm is the strongest of all mechanical devices, and there is no need for surprise at its doing its work well and economically.

The Cleveland Worm & Gear Company
Cleveland, Ohio

NEW TYPE PACKARD MOTOR TRUCKS

MADE IN AMERICA

CAPACITIES FROM ONE TO SIX TONS INCLUSIVE

IN announcing a new series of trucks, we wish to emphasize the fact that the Packard line fills practically every want in highway transportation. The new product is a logical evolution based on ten years' experience in the manufacture of heavy duty vehicles.

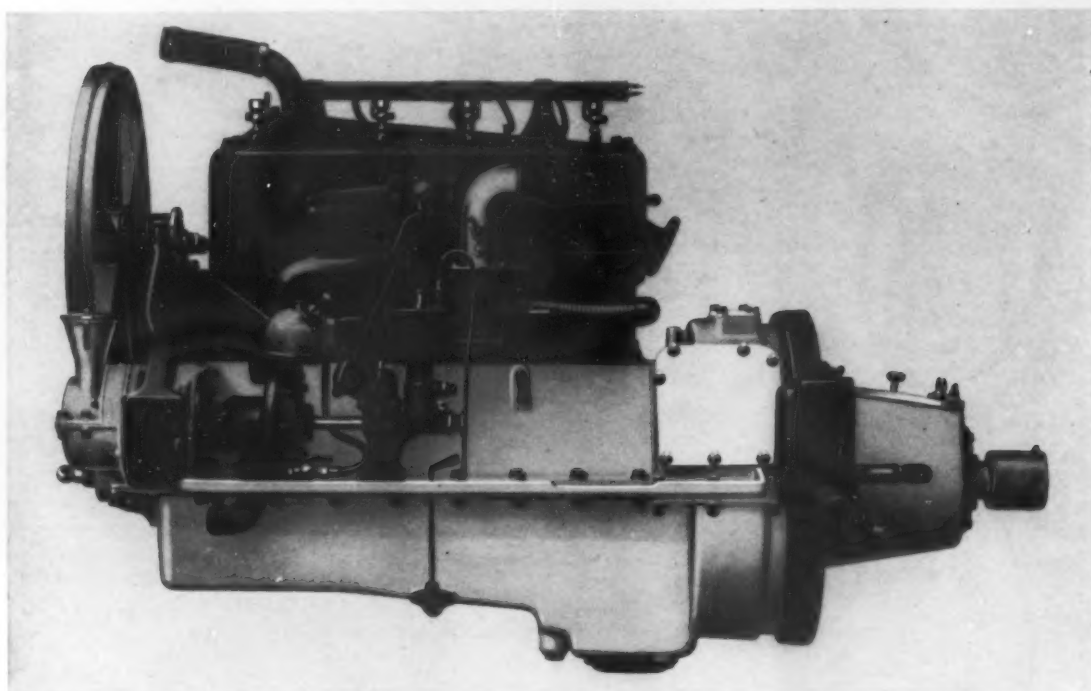
At every stage of Packard progress, we produced the best that could be built at that time. With our unequalled facilities for research and development, we are now able to offer a design which we believe will remain substantially unchanged for a period of years.

The new Packards will command the attention of careful business men because *their successful and satisfactory operation is accomplished with a minimum of attention, effort and expense.*

*BUILT IN THE LARGEST AND MOST
MODERN MOTOR TRUCK SHOPS IN THE
UNITED STATES; THEIR STAMINA
DEVELOPED IN THE MOST ADVANCED
HEAT-TREATING PLANT IN THE WORLD*

PACKARD MOTOR CAR COMPANY, DETROIT

THE NEW PACKARD MOTOR TRUCKS



The new Packard motor with its automatic governor, enclosed and sealed, water jacketed and thoroughly protected carburetor and the most improved ignition is as nearly automatic as a motor can be.

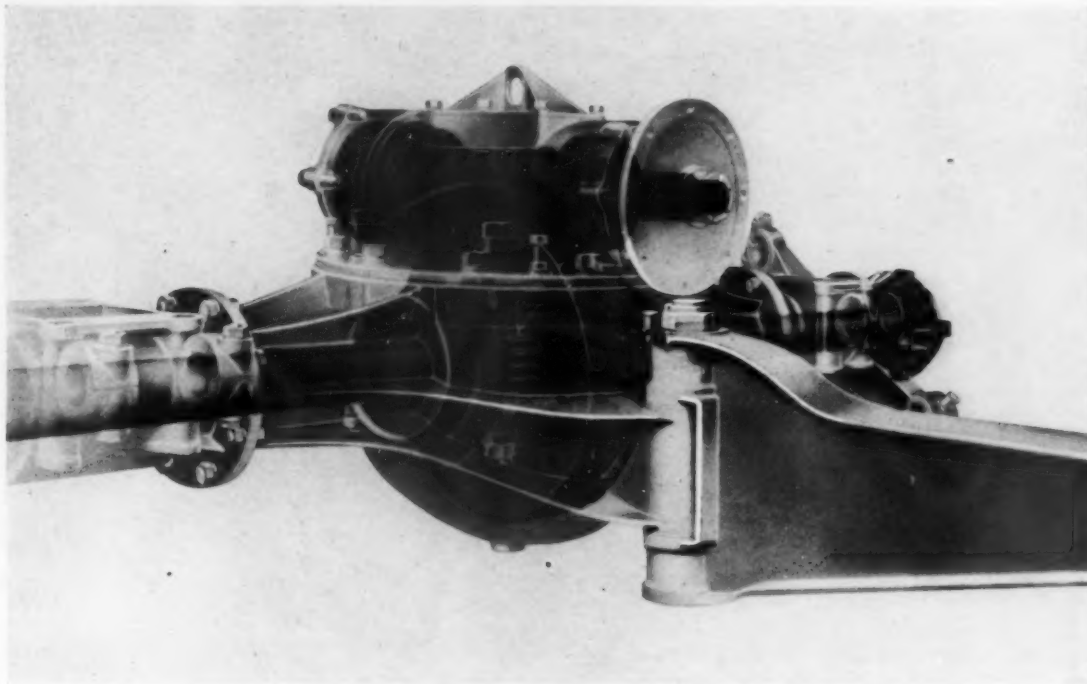


THE silence of the new Packard trucks is an indication of their advanced design. Quietness in machinery means reduced wear and the result is low depreciation. With the remarkably smooth and positive action of motor and transmission, comes also the assurance of reserve power sufficient to meet every demand.


The range of capacities is sufficient to answer the requirements of all branches of truck transportation and each unit is so designed as to give the maximum service in hauling its normal load. You are enabled to standardize your hauling with equipment known to be the best that can be built.

The compact and simple construction sets a new standard for accessibility, and it is our belief that these trucks can be operated and maintained with less mechanical attention than any other make.

THE NEW PACKARD MOTOR TRUCKS



Packard design overcomes the difficulties formerly identified with the installation of worm drive.

 **THE** fact that all working parts are enclosed, and thus protected from mud and water, is another factor that makes for reduction in repair expense and for longer life of the truck.

A significant detail of the new design is the centralized control board, giving complete mastery of the car from the driver's seat.

This feature is one of numerous improvements so designed and perfected as to relieve the driver of much of the annoyance and delay attached to the operation of the ordinary truck. Electric lighting and cranking are offered as special equipment with the new line.

While the limitations of this space do not permit of a detailed mechanical description, some of the more notable improvements are listed on the ensuing page.

GOOD REASONS FOR THE NEW PACKARD TRUCKS

Packard automatic carburetor provided with hot-water jacket and hot air for low grade gasoline. Economy in gasoline consumption.

All motor bearings run on film of oil under pressure. Economy in oil consumption.

Silent worm drive in oil bath. Economy of power.

Three point suspension. Saves motor and transmission from distortion on uneven roads.

Packard multiple disc clutch. Hardened steel plates against woven asbestos fabric.

Packard-Bijur electric starting and lighting. (Special equipment.)

Electrical and carburetor controls within easy reach of driver's hand.

Left drive and left side levers. Greater safety and convenience.

Steering connections have automatic adjustment, which takes up wear and prevents rattles.

Maximum speed of truck controlled by automatic governor fully enclosed and sealed.

Rear wheel hub drive with universal action. Prevents axle breakage.

Service brakes aft of transmission will lock rear wheels if necessary—fan-cooled, readily adjustable and long lived.

Emergency brakes with overhead hinge-point to prevent rattle.

Low chassis. Easier to load and unload.

Maximum accessibility. All units readily removable.

Compact and clean design.

All units have special provision to prevent leakage of oil.

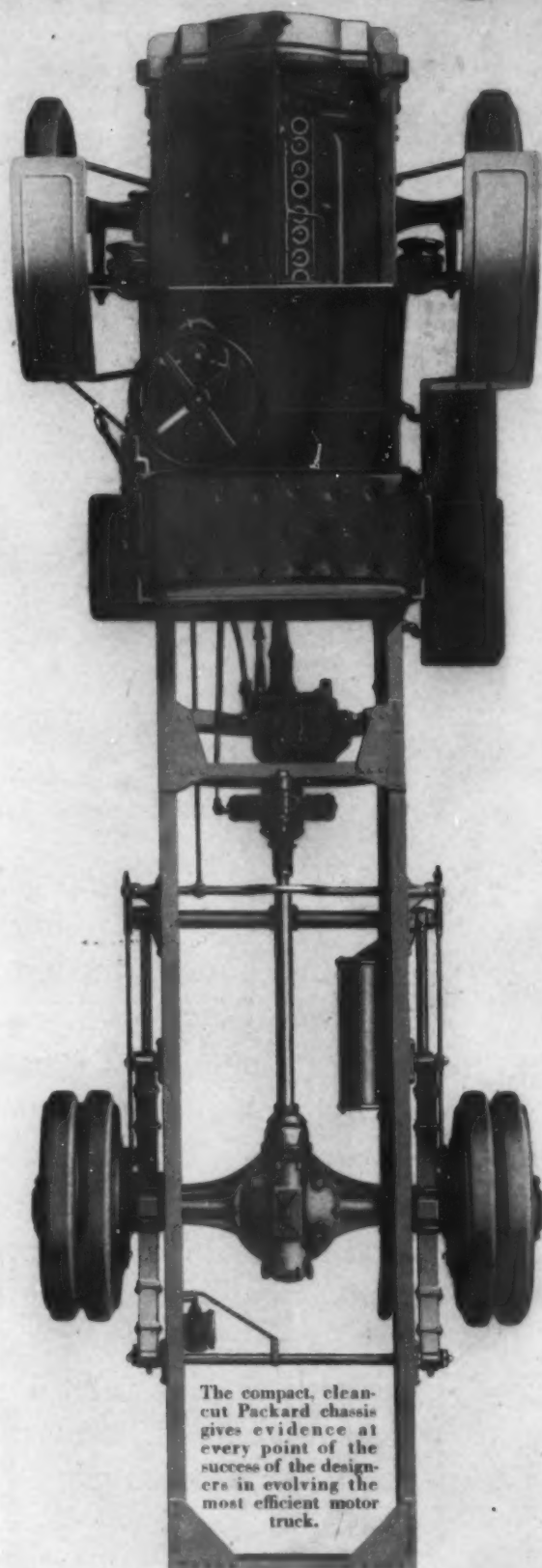
All valve mechanism enclosed and automatically lubricated.

Radiator flexibly mounted and free from distortion.

Independent bonnet support unaffected by radiator movement.

Battery specially mounted on frame side, avoiding road shocks.

PACKARD MOTOR CAR CO., DETROIT



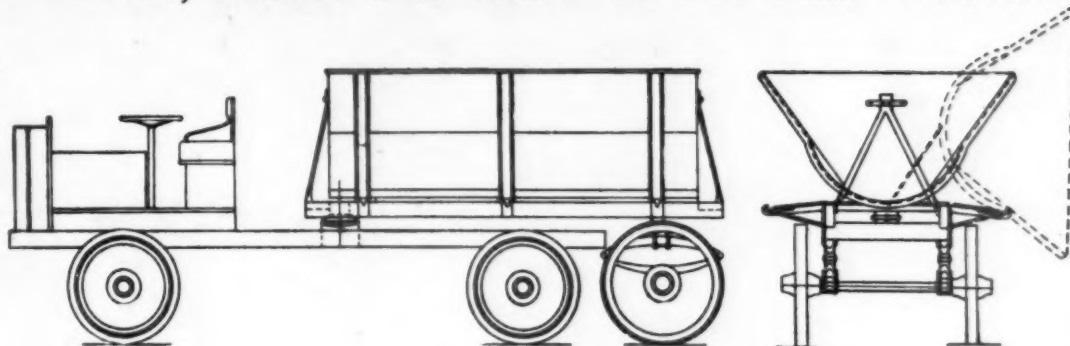
The compact, clean-cut Packard chassis gives evidence at every point of the success of the designers in evolving the most efficient motor truck.



The Jeffery Quad



Drives, Brakes and Steers On All Four Wheels



This is the best proposition ever offered to coal, sand, gravel and building material dealers. It is a combination of the famous Jeffery Quad with a Lee patent two-way side-dump body on a semi-trailer. This combination has a capacity of 5 to 7 tons. It has no complicated machinery to get out of order. It is quick in operation. The body can be dumped and returned to loading position in less than a minute. A school boy can operate it. It is exceedingly economical to operate, as two-thirds of the load is carried on the steel-tired wheels of the semi-trailer. It will turn in one-half the space that a rear-drive truck requires. The price is \$3,840 f. o. b. Kenosha. This is a 5 to 7 ton dump truck that costs no more than an ordinary 3-ton truck either to purchase or to operate.

Coal and Building Supply Dealers Need

The Jeffery Quad

Because:

1. It can pull through mud, snow, sand, etc., that will stall any rear-drive truck made. For coal dealers it solves the unpaved alley problem.
2. It is the most remarkable hill-climber.
3. It has very small upkeep expense.
4. It is designed to pull trailers.
5. It has a short turning radius.
6. It has fewer different parts than any other first-class truck.
7. The front and rear wheels track together.
8. It has extraordinary braking capacity.
9. It is practically non-skiddable.
10. It has the endorsement of the United States and foreign governments.
11. It has the remarkable M. & S. locking differentials that automatically put the full power of the motor into any wheel or wheels that can get traction when the others cannot.

Price of Jeffery Quad, 2-ton chassis, \$2750 f. o. b. Kenosha.
Maximum speed of Quad governed to from 14 to 17 miles an hour.
Maximum speed of Quad and semi-trailer, 10 to 12 miles an hour.

Write now for Catalog F-1



This dump-body Quad truck will drive up any alley as long as it can find a holding bottom to get traction. All kinds of hand or power hoists can be furnished, including a three-way dump and an elevating or turntable hoist.

The Thomas B. Jeffery Company

Main Office and Works, Kenosha, Wis., U. S. A.

Cable Address "Jeffcar"

When Writing, Please Say—"Saw Your Ad. in the C C J"



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